ENVIRONMENTAL STANDARDS
Setting the Standards for Innovative Environmental Solutions

# Data Validation Report
# Tennessee Valley Authority
# Cumberland Fossil Plant
# Environmental Investigation Plan
# Biota Samples
# Chain-of-Custody: CUF_FH_20190117_1A

This quality assurance (QA) review is based upon an examination of the data generated from the analyses of the 45 biota samples collected on April 10 and 17, 2018, and on May 1, 2, 8, 9, and 10, 2018, at the Tennessee Valley Authority (TVA) Cumberland Fossil Plant facility. These samples were collectively analyzed by Pace Analytical Services, Inc. (Pace), of Green Bay, Wisconsin, for total metals by SW-846 Method 6020; for total mercury by SW-846 Method 7473; and for percent moisture by American Society for Testing and Materials (ASTM) Method D2974-87.

This review was performed in accordance with the Environmental Investigation Plan, Cumberland Fossil Plant (CUF EIP; Revision 3, June 2018). This review was performed with guidance from the National Functional Guidelines for Inorganic Data Review (US EPA, October 2004); the US EPA Region IV Data Validation Standard Operating Procedures for Contract Laboratory Program Routine Analytical Services (Revision 2.1, July 1999); and the US EPA Region IV Data Validation Standard Operating Procedure. These validation guidance documents specifically address analyses performed in accordance with the Contract Laboratory Program (CLP) analytical methods and are not completely applicable to the type of analyses and analytical protocols performed for the SW-846 and ASTM Methods utilized by the laboratory for these samples. Environmental Standards, Inc. (Environmental Standards), used professional judgment to determine the usability of the analytical results and compliance relative to the SW-846, ASTM, and Pace Methods.

## Summary

The analytical results and associated laboratory QA/QC samples were reviewed to determine the integrity of the reported analytical results and to ensure that the data met the established data quality objectives. This QA review includes all samples in Pace Work Orders 40182296, 40182297, and 40182299.

The samples that have undergone Stage 4 data validation are listed below:

| Sample Identification | Laboratory Sample Identification | Job Number | Matrix | Date Sample Collected | Parameter(s) Examined |
|---|---|---|---|---|---|
| CUF-FH-BG-CURD-F-20180509 | 40182296001 | 40182296 | Biota | 5/9/18 | M, Hg, PM |
| CUF-FH-BG-CURA-F-20180509 | 40182296002 | 40182296 | Biota | 5/9/18 | M, Hg, PM |
| CUF-FH-BG-CURU-F-20180509 | 40182296003 | 40182296 | Biota | 5/9/18 | M, Hg, PM |
| CUF-FH-BG-WCD-F-20180510 | 40182296004 | 40182296 | Biota | 5/10/18 | M, Hg, PM |
| CUF-FH-BG-WCU-F-20180508 | 40182296005 | 40182296 | Biota | 5/8/18 | M, Hg, PM |
| CUF-FH-CC-CURD-F-20180509 | 40182296006 | 40182296 | Biota | 5/9/18 | M, Hg, PM |
| CUF-FH-CC-CURA-F-20180509 | 40182296007 | 40182296 | Biota | 5/9/18 | M, Hg, PM |
| CUF-FH-CC-CURU-F-20180502 | 40182296008 | 40182296 | Biota | 5/2/18 | M, Hg, PM |
| CUF-FH-CC-WCD-F-20180410 | 40182296009 | 40182296 | Biota | 4/10/18 | M, Hg, PM |
| CUF-FH-CC-WCU-F-20180410 | 40182296010 | 40182296 | Biota | 4/10/18 | M, Hg, PM |
| CUF-FH-LB-CURD-F-20180410 | 40182296011 | 40182296 | Biota | 4/10/18 | M, Hg, PM |
| CUF-FH-LB-CURA-F-20180410 | 40182296012 | 40182296 | Biota | 4/10/18 | M, Hg, PM |
| CUF-FH-LB-CURU-F-20180509 | 40182296013 | 40182296 | Biota | 5/9/18 | M, Hg, PM |
| CUF-FH-LB-WCD-F-20180410 | 40182296014 | 40182296 | Biota | 4/10/18 | M, Hg, PM |
| CUF-FH-LB-WCU-F-20180410 | 40182296015 | 40182296 | Biota | 4/10/18 | M, Hg, PM |
| CUF-FH-RS-CURD-F-20180509 | 40182296016 | 40182296 | Biota | 5/9/18 | M, Hg, PM |
| CUF-FH-RS-CURA-F-20180501 | 40182296017 | 40182296 | Biota | 5/1/18 | M, Hg, PM |
| CUF-FH-RS-CURU-F-20180502 | 40182296018 | 40182296 | Biota | 5/2/18 | M, Hg, PM |
| CUF-FH-RS-WCD-F-20180510 | 40182296019 | 40182296 | Biota | 5/10/18 | M, Hg, PM |
| CUF-FH-RS-WCU-F-20180501 | 40182296020 | 40182296 | Biota | 5/1/18 | M, Hg, PM |
| CUF-FH-BG-CURD-O-20180509 | 40182297001 | 40182297 | Biota | 5/9/18 | M, Hg, PM |
| CUF-FH-BG-CURA-O-20180509 | 40182297002 | 40182297 | Biota | 5/9/18 | M, Hg, PM |
| CUF-FH-BG-CURU-O-20180509 | 40182297003 | 40182297 | Biota | 5/9/18 | M, Hg, PM |
| CUF-FH-BG-WCD-O-20180510 | 40182297004 | 40182297 | Biota | 5/10/18 | M, Hg, PM |
| CUF-FH-BG-WCU-O-20180508 | 40182297005 | 40182297 | Biota | 5/8/18 | M, Hg, PM |
| CUF-FH-CC-CURD-O-20180509 | 40182297006 | 40182297 | Biota | 5/9/18 | M, Hg, PM |
| CUF-FH-CC-CURA-O-20180509 | 40182297007 | 40182297 | Biota | 5/9/18 | M, Hg, PM |
| CUF-FH-CC-CURU-O-20180502 | 40182297008 | 40182297 | Biota | 5/2/18 | M, Hg, PM |
| CUF-FH-CC-WCD-O-20180410 | 40182297009 | 40182297 | Biota | 4/10/18 | M, Hg, PM |
| CUF-FH-CC-WCU-O-20180410 | 40182297010 | 40182297 | Biota | 4/10/18 | M, Hg, PM |
| CUF-FH-LB-CURD-O-20180410 | 40182297011 | 40182297 | Biota | 4/10/18 | M, Hg, PM |

| Sample Identification | Laboratory Sample Identification | Job Number | Matrix | Date Sample Collected | Parameter(s) Examined |
|---|---|---|---|---|---|
| CUF-FH-LB-CURA-O-20180410 | 40182297012 | 40182297 | Biota | 4/10/18 | M, Hg, PM |
| CUF-FH-LB-CURU-O-20180509 | 40182297013 | 40182297 | Biota | 5/9/18 | M, Hg, PM |
| CUF-FH-LB-WCD-O-20180410 | 40182297014 | 40182297 | Biota | 4/10/18 | M, Hg, PM |
| CUF-FH-LB-WCU-O-20180410 | 40182297015 | 40182297 | Biota | 4/10/18 | M, Hg, PM |
| CUF-FH-RS-CURD-O-20180509 | 40182297016 | 40182297 | Biota | 5/9/18 | M, Hg, PM |
| CUF-FH-RS-CURA-O-20180501 | 40182297017 | 40182297 | Biota | 5/1/18 | M, Hg, PM |
| CUF-FH-RS-CURU-O-20180502 | 40182297018 | 40182297 | Biota | 5/2/18 | M, Hg, PM |
| CUF-FH-RS-WCD-O-20180510 | 40182297019 | 40182297 | Biota | 5/10/18 | M, Hg, PM |
| CUF-FH-RS-WCU-O-20180501 | 40182297020 | 40182297 | Biota | 5/1/18 | M, Hg, PM |
| CUF-FH-SH-CURD-WF-20180410 | 40182299001 | 40182299 | Biota | 4/10/18 | M, Hg, PM |
| CUF-FH-SH-CURA-WF-20180410 | 40182299002 | 40182299 | Biota | 4/10/18 | M, Hg, PM |
| CUF-FH-SH-CURU-WF-20180417 | 40182299003 | 40182299 | Biota | 4/17/18 | M, Hg, PM |
| CUF-FH-SH-WCD-WF-20180410 | 40182299004 | 40182299 | Biota | 4/10/18 | M, Hg, PM |
| CUF-FH-SH-WCU-WF-20180410 | 40182299005 | 40182299 | Biota | 4/10/18 | M, Hg, PM |

Parameters Examined

M - Total Metals by SW-846 Method 6020.
Hg - Total Mercury by SW-846 Method 7473.
PM - Percent Moisture by ASTM Method D2974-87.

| Items Reviewed | |
|---|---|
| Holding Times | Instrument Tuning and Calibrations |
| Sample Preservation | Reporting Limit (RL) Standard Recoveries |
| Chain-of-Custody (COC) Records and Case Narratives | Internal Standard Recoveries |
| Blank Results | Serial Dilution Analysis |
| Matrix Spike/Matrix Spike Duplicate (MS/MSD) Results | Post-Digestion Spike Results |
| Laboratory Control Sample (LCS) Results | Sample Preparation |
| Laboratory Duplicate Results | Analytical Sequence |
| Quantitation of Positive Results | Standard Reference Material Results |

**Comments and Exceptions**

- All analyses performed for the sampling event were in compliance with the requirements set forth in the EIP.

**Qualifier Summary**

| Analyte(s) | Job Number(s) | Sample(s) | Validation Qualifier(s) | Reason(s) for Qualification |
|---|---|---|---|---|
| total arsenic | 40182297 | CUF-FH-BG-CURD-O-20180509, CUF-FH-BG-CURU-O-20180509, CUF-FH-LB-CURD-O-20180410, CUF-FH-LB-CURA-O-20180410, CUF-FH-LB-CURU-O-20180509, CUF-FH-LB-WCD-O-20180410, CUF-FH-LB-WCU-O-20180410, CUF-FH-RS-CURA-O-20180501, CUF-FH-RS-CURU-O-20180502, CUF-FH-RS-WCD-O-20180510, and CUF-FH-RS-WCU-O-20180501 | U* | BE, BL |
| total cadmium | 40182297 | CUF-FH-BG-CURD-O-20180509 | U* | BE, BL |

| Analyte(s) | Job Number(s) | Sample(s) | Validation Qualifier(s) | Reason(s) for Qualification |
|---|---|---|---|---|
| total arsenic | 40182296 and 40182299 | CUF-FH-LB-CURD-F-20180410, CUF-FH-LB-CURA-F-20180410, CUF-FH-LB-CURU-F-20180509, CUF-FH-LB-WCD-F-20180410, CUF-FH-LB-WCU-F-20180410, CUF-FH-RS-CURD-F-20180509, CUF-FH-RS-CURA-F-20180501, CUF-FH-RS-CURU-F-20180502, CUF-FH-RS-WCD-F-20180510, CUF-FH-RS-WCU-F-20180501, CUF-FH-SH-CURD-WF-20180410, CUF-FH-SH-CURA-WF-20180410, and CUF-FH-SH-CURU-WF-20180417 | U* | BE |
| total barium | 40182296 | CUF-FH-BG-CURD-F-20180509, CUF-FH-BG-CURA-F-20180509, CUF-FH-BG-WCD-F-20180510, CUF-FH-BG-WCU-F-20180508, CUF-FH-LB-WCD-F-20180410, CUF-FH-RS-WCD-F-20180510, and CUF-FH-RS-WCU-F-20180501 | U* | BE |
| total barium | 40182297 | All samples except CUF-FH-LB-CURD-O-20180410, CUF-FH-LB-CURA-O-20180410, CUF-FH-LB-CURU-O-20180509, CUF-FH-LB-WCD-O-20180410, and CUF-FH-LB-WCU-O-20180410 | U* | BE |
| total cadmium | 40182299 | All samples | U* | BE |
| total copper | 40182296 and 40182299 | CUF-FH-BG-WCD-F-20180510, CUF-FH-CC-CURD-F-20180509, CUF-FH-CC-CURA-F-20180509, CUF-FH-CC-CURU-F-20180502, CUF-FH-CC-WCD-F-20180410, CUF-FH-CC-WCU-F-20180410, CUF-FH-LB-WCD-F-20180410, CUF-FH-RS-CURU-F-20180502, CUF-FH-SH-CURA-WF-20180410, CUF-FH-SH-CURU-WF-20180417, CUF-FH-SH-WCD-WF-20180410, and CUF-FH-SH-WCU-WF-20180410 | U* | BE |
| total copper | 40182297 | All samples | U* | BE |
| total antimony and total silver | 40182297 | CUF-FH-BG-CURD-O-20180509 | U* | BL |

| Analyte(s) | Job Number(s) | Sample(s) | Validation Qualifier(s) | Reason(s) for Qualification |
|---|---|---|---|---|
| total cobalt | 40182297 | All samples | U* | BL |
| total molybdenum | 40182297 | CUF-FH-BG-CURD-O-20180509, CUF-FH-BG-WCU-O-20180508, CUF-FH-LB-CURU-O-20180509, and CUF-FH-RS-WCD-O-20180510 | U* | BL |
| total vanadium | 40182297 | CUF-FH-RS-CURD-O-20180509 and CUF-FH-RS-WCD-O-20180510 | U* | BL |
| total mercury | 40182297 | All samples except CUF-FH-BG-CURD-O-20180509, CUF-FH-BG-WCU-O-20180508, CUF-FH-CC-CURD-O-20180509, CUF-FH-CC-CURU-O-20180502, CUF-FH-CC-WCU-O-20180410, CUF-FH-RS-CURD-O-20180509, and CUF-FH-RS-WCU-O-20180501 | U* | BL |
| total thallium | 40182299 | CUF-FH-SH-CURA-WF-20180410 and CUF-FH-SH-WCD-WF-20180410 | U* | BL |
| total mercury | 40182299 | All samples | U* | BL |
| total mercury | 40182296 | CUF-FH-CC-CURA-F-20180509, CUF-FH-CC-WCD-F-20180410, CUF-FH-CC-WCU-F-20180410, and CUF-FH-RS-WCU-F-20180501 | J | C |
| total chromium | 40182296 and 40182299 | All samples | J/UJ | L- |

Unless otherwise qualified, all positive results reported between the method detection limit (MDL) and quantitation limit (QL) should be considered estimated and have been flagged “J” on the data tables. (Reason Code: RL)

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Review performed by: Danielle Coles, Senior Quality Assurance Chemist
Review reviewed and approved by: Andrew L. Piasecki, Senior Quality Assurance Chemist
Review approved by: Rock J. Vitale, CEAC, Technical Director of Chemistry/Principal
Date review completed: 4/4/19

# SECTION 2

# ANALYTICAL RESULTS

# INORGANIC DATA QUALIFIERS

U* This result should be considered “not-detected” because it was detected in a rinsate blank or laboratory blank at a similar level.

UR Unreliable reporting limit; analyte may or may not be present in sample.

R Unreliable positive result; analyte may or may not be present in sample.

J Quantitation is approximate due to limitations identified during data validation.

UJ This analyte was not detected, but the reporting limit may or may not be higher due to a bias identified during data validation.

# REASON CODES AND EXPLANATIONS

| Reason Code | Explanation |
|---|---|
| BE | Equipment blank contamination. The result should be considered “not-detected.” |
| BF | Field blank contamination. The result should be considered “not-detected.” |
| BL | Laboratory blank contamination. The result should be considered “not-detected.” |
| BN | Negative laboratory blank contamination. |
| C | Initial and/or Continuing Calibration issue, indeterminate bias. |
| C+ | Initial and/or Continuing Calibration issue. The result may be biased high. |
| C- | Initial and/or Continuing Calibration issue. The result may be biased low. |
| FD | Field duplicate imprecision. |
| FG | Total versus Dissolved Imprecision. |
| H | Holding time exceeded. |
| I | Internal standard recovery outside of acceptance limits. |
| L | LCS and LCSD recoveries outside of acceptance limits, indeterminate bias. |
| L+ | LCS and/or LCSD recoveries outside of acceptance limits. The result may be biased high. |
| L- | LCS and/or LCSD recoveries outside of acceptance limits. The result may be biased low. |
| LD | Laboratory duplicate imprecision. |
| LP | LCS/LCSD imprecision. |
| M | MS and MSD recoveries outside of acceptance limits, indeterminate bias. |
| M+ | MS and/or MSD recoveries outside of acceptance limits. The result may be biased high. |
| M- | MS and/or MSD recoveries outside of acceptance limits. The result may be biased low. |
| MP | MS/MSD imprecision. |
| P | Post-digestion spike recoveries outside of acceptance limits, indeterminate bias. |
| P+ | Post-digestion spike recovery outside of acceptance limits. The result may be biased high. |
| P- | Post-digestion spike recovery outside of acceptance limits. The result may be biased low. |
| Q | Chemical Preservation issue. |
| R | RL standards outside of acceptance limits, indeterminate bias. |
| R+ | RL standard(s) outside of acceptance limits. The result may be biased high. |
| R- | RL standard(s) outside of acceptance limits. The result may be biased low. |
| RL | Reported result between the MDL and the QL. |
| T | Temperature preservation issue. |
| SD | Serial Dilution imprecision. |
| X | Percent solids < 50%. |
| Y+ | Chemical Yield outside of acceptance limits. The result may be biased high. |
| Y- | Chemical yield outside of acceptance limits. The result may be biased low. |
| Z | ICP or ICP/MS Interference. |
| ZZ | Other. |

## A. WORK ORDER 40182296

**TVA TDEC Program**
**Facility: Cumberland Fossil Plant**
**SDG: 40182296**

| | |
|---|---|
| **Lab Sample ID** | 40182296001 |
| **Sys Sample Code** | CUF-FH-BG-CURD-F-20180509 |
| **Sample Name** | CUF-FH-BG-CURD-F-20180509 |
| **Sample Date** | 5/9/2018 5:50:00 PM |
| **Location** | CURD |
| **Sample Type** | N |
| **Parent Sample** | |

| Analytic Method | Chemical Name | CAS Rn | Fraction | Result Unit | Final Result | Final Qual | Reason code | Final MDL | Final RL | Final QL | Final Detect | Final Report | DF | Basis |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| ASTM D2974-87 | Percent Moisture | MOISTURE | N | % | 82.0 | | | 0.10 | 0.10 | 0.10 | Y | Yes | 1 | WET |
| SW-846 6020A | Antimony | 7440-36-0 | T | MG/KG | | U | | 0.016 | 0.016 | 0.099 | N | Yes | 1 | WET |
| | Arsenic | 7440-38-2 | T | MG/KG | | U | | 0.030 | 0.030 | 0.10 | N | Yes | 1 | WET |
| | Barium | 7440-39-3 | T | MG/KG | | U* | BE | 0.046 | 0.046 | 0.10 | N | Yes | 1 | WET |
| | Beryllium | 7440-41-7 | T | MG/KG | | U | | 0.033 | 0.033 | 0.11 | N | Yes | 1 | WET |
| | Boron | 7440-42-8 | T | MG/KG | | U | | 0.69 | 0.69 | 2.3 | N | Yes | 1 | WET |
| | Cadmium | 7440-43-9 | T | MG/KG | | U | | 0.014 | 0.014 | 0.099 | N | Yes | 1 | WET |
| | Calcium | 7440-70-2 | T | MG/KG | 380 | | | 25.3 | 25.3 | 84.2 | Y | Yes | 1 | WET |
| | Chromium | 7440-47-3 | T | MG/KG | | UJ | L- | 0.088 | 0.088 | 0.29 | N | Yes | 1 | WET |
| | Cobalt | 7440-48-4 | T | MG/KG | | U | | 0.0082 | 0.0082 | 0.099 | N | Yes | 1 | WET |
| | Copper | 7440-50-8 | T | MG/KG | | U | | 0.28 | 0.28 | 0.94 | N | Yes | 1 | WET |
| | Lead | 7439-92-1 | T | MG/KG | | U | | 0.026 | 0.026 | 0.087 | N | Yes | 1 | WET |
| | Lithium | 7439-93-2 | T | MG/KG | | U | | 0.021 | 0.021 | 0.099 | N | Yes | 1 | WET |
| | Molybdenum | 7439-98-7 | T | MG/KG | | U | | 0.036 | 0.036 | 0.12 | N | Yes | 1 | WET |
| | Nickel | 7440-02-0 | T | MG/KG | | U | | 0.041 | 0.041 | 0.14 | N | Yes | 1 | WET |
| | Selenium | 7782-49-2 | T | MG/KG | 0.34 | | | 0.050 | 0.050 | 0.17 | Y | Yes | 1 | WET |
| | Silver | 7440-22-4 | T | MG/KG | | U | | 0.011 | 0.011 | 0.050 | N | Yes | 1 | WET |
| | Strontium | 7440-24-6 | T | MG/KG | 0.31 | J | RL | 0.16 | 0.16 | 0.53 | Y | Yes | 1 | WET |
| | Thallium | 7440-28-0 | T | MG/KG | | U | | 0.013 | 0.013 | 0.099 | N | Yes | 1 | WET |
| | Vanadium | 7440-62-2 | T | MG/KG | | U | | 0.033 | 0.033 | 0.11 | N | Yes | 1 | WET |
| | Zinc | 7440-66-6 | T | MG/KG | 7.0 | | | 1.7 | 1.7 | 5.7 | Y | Yes | 1 | WET |
| SW-846 7473 | Mercury | 7439-97-6 | T | MG/KG | 0.10 | | | 0.0030 | 0.0030 | 0.019 | Y | Yes | 1 | WET |

**TVA TDEC Program**
**Facility: Cumberland Fossil Plant**
**SDG: 40182296**

| | |
|---|---|
| **Lab Sample ID** | 40182296002 |
| **Sys Sample Code** | CUF-FH-BG-CURA-F-20180509 |
| **Sample Name** | CUF-FH-BG-CURA-F-20180509 |
| **Sample Date** | 5/9/2018 2:17:00 PM |
| **Location** | CURA |
| **Sample Type** | N |
| **Parent Sample** | |

| Analytic Method | Chemical Name | CAS Rn | Fraction | Result Unit | Final Result | Final Qual | Reason code | Final MDL | Final RL | Final QL | Final Detect | Final Report | DF | Basis |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| ASTM D2974-87 | Percent Moisture | MOISTURE | N | % | 82.1 | | | 0.10 | 0.10 | 0.10 | Y | Yes | 1 | WET |
| SW-846 6020A | Antimony | 7440-36-0 | T | MG/KG | | U | | 0.015 | 0.015 | 0.093 | N | Yes | 1 | WET |
| | Arsenic | 7440-38-2 | T | MG/KG | | U | | 0.028 | 0.028 | 0.094 | N | Yes | 1 | WET |
| | Barium | 7440-39-3 | T | MG/KG | | U* | BE | 0.040 | 0.040 | 0.095 | N | Yes | 1 | WET |
| | Beryllium | 7440-41-7 | T | MG/KG | | U | | 0.031 | 0.031 | 0.10 | N | Yes | 1 | WET |
| | Boron | 7440-42-8 | T | MG/KG | | U | | 0.65 | 0.65 | 2.2 | N | Yes | 1 | WET |
| | Cadmium | 7440-43-9 | T | MG/KG | | U | | 0.013 | 0.013 | 0.093 | N | Yes | 1 | WET |
| | Calcium | 7440-70-2 | T | MG/KG | 275 | | | 23.7 | 23.7 | 79.1 | Y | Yes | 1 | WET |
| | Chromium | 7440-47-3 | T | MG/KG | | UJ | L- | 0.083 | 0.083 | 0.28 | N | Yes | 1 | WET |
| | Cobalt | 7440-48-4 | T | MG/KG | 0.0090 | J | RL | 0.0077 | 0.0077 | 0.093 | Y | Yes | 1 | WET |
| | Copper | 7440-50-8 | T | MG/KG | | U | | 0.27 | 0.27 | 0.89 | N | Yes | 1 | WET |
| | Lead | 7439-92-1 | T | MG/KG | | U | | 0.024 | 0.024 | 0.082 | N | Yes | 1 | WET |
| | Lithium | 7439-93-2 | T | MG/KG | | U | | 0.020 | 0.020 | 0.093 | N | Yes | 1 | WET |
| | Molybdenum | 7439-98-7 | T | MG/KG | | U | | 0.033 | 0.033 | 0.11 | N | Yes | 1 | WET |
| | Nickel | 7440-02-0 | T | MG/KG | 0.042 | J | RL | 0.038 | 0.038 | 0.13 | Y | Yes | 1 | WET |
| | Selenium | 7782-49-2 | T | MG/KG | 0.39 | | | 0.047 | 0.047 | 0.16 | Y | Yes | 1 | WET |
| | Silver | 7440-22-4 | T | MG/KG | | U | | 0.010 | 0.010 | 0.047 | N | Yes | 1 | WET |
| | Strontium | 7440-24-6 | T | MG/KG | 0.20 | J | RL | 0.15 | 0.15 | 0.50 | Y | Yes | 1 | WET |
| | Thallium | 7440-28-0 | T | MG/KG | 0.015 | J | RL | 0.012 | 0.012 | 0.093 | Y | Yes | 1 | WET |
| | Vanadium | 7440-62-2 | T | MG/KG | | U | | 0.031 | 0.031 | 0.10 | N | Yes | 1 | WET |
| | Zinc | 7440-66-6 | T | MG/KG | 7.1 | | | 1.6 | 1.6 | 5.4 | Y | Yes | 1 | WET |
| SW-846 7473 | Mercury | 7439-97-6 | T | MG/KG | 0.12 | | | 0.0032 | 0.0032 | 0.020 | Y | Yes | 1 | WET |

**TVA TDEC Program**
**Facility: Cumberland Fossil Plant**
**SDG: 40182296**

| | |
|---|---|
| **Lab Sample ID** | 40182296003 |
| **Sys Sample Code** | CUF-FH-BG-CURU-F-20180509 |
| **Sample Name** | CUF-FH-BG-CURU-F-20180509 |
| **Sample Date** | 5/9/2018 11:20:00 AM |
| **Location** | CURU |
| **Sample Type** | N |
| **Parent Sample** | |

| Analytic Method | Chemical Name | CAS Rn | Fraction | Result Unit | Final Result | Final Qual | Reason code | Final MDL | Final RL | Final QL | Final Detect | Final Report | DF | Basis |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| ASTM D2974-87 | Percent Moisture | MOISTURE | N | % | 82.6 | | | 0.10 | 0.10 | 0.10 | Y | Yes | 1 | WET |
| SW-846 6020A | Antimony | 7440-36-0 | T | MG/KG | | U | | 0.016 | 0.016 | 0.098 | N | Yes | 1 | WET |
| | Arsenic | 7440-38-2 | T | MG/KG | | U | | 0.029 | 0.029 | 0.098 | N | Yes | 1 | WET |
| | Barium | 7440-39-3 | T | MG/KG | | U | | 0.030 | 0.030 | 0.099 | N | Yes | 1 | WET |
| | Beryllium | 7440-41-7 | T | MG/KG | | U | | 0.032 | 0.032 | 0.11 | N | Yes | 1 | WET |
| | Boron | 7440-42-8 | T | MG/KG | | U | | 0.68 | 0.68 | 2.3 | N | Yes | 1 | WET |
| | Cadmium | 7440-43-9 | T | MG/KG | | U | | 0.014 | 0.014 | 0.098 | N | Yes | 1 | WET |
| | Calcium | 7440-70-2 | T | MG/KG | 249 | | | 24.8 | 24.8 | 82.5 | Y | Yes | 1 | WET |
| | Chromium | 7440-47-3 | T | MG/KG | | UJ | L- | 0.086 | 0.086 | 0.29 | N | Yes | 1 | WET |
| | Cobalt | 7440-48-4 | T | MG/KG | 0.0089 | J | RL | 0.0080 | 0.0080 | 0.098 | Y | Yes | 1 | WET |
| | Copper | 7440-50-8 | T | MG/KG | | U | | 0.28 | 0.28 | 0.92 | N | Yes | 1 | WET |
| | Lead | 7439-92-1 | T | MG/KG | | U | | 0.026 | 0.026 | 0.085 | N | Yes | 1 | WET |
| | Lithium | 7439-93-2 | T | MG/KG | | U | | 0.020 | 0.020 | 0.098 | N | Yes | 1 | WET |
| | Molybdenum | 7439-98-7 | T | MG/KG | | U | | 0.035 | 0.035 | 0.12 | N | Yes | 1 | WET |
| | Nickel | 7440-02-0 | T | MG/KG | | U | | 0.040 | 0.040 | 0.13 | N | Yes | 1 | WET |
| | Selenium | 7782-49-2 | T | MG/KG | 0.36 | | | 0.049 | 0.049 | 0.16 | Y | Yes | 1 | WET |
| | Silver | 7440-22-4 | T | MG/KG | | U | | 0.011 | 0.011 | 0.049 | N | Yes | 1 | WET |
| | Strontium | 7440-24-6 | T | MG/KG | 0.18 | J | RL | 0.16 | 0.16 | 0.52 | Y | Yes | 1 | WET |
| | Thallium | 7440-28-0 | T | MG/KG | | U | | 0.013 | 0.013 | 0.098 | N | Yes | 1 | WET |
| | Vanadium | 7440-62-2 | T | MG/KG | | U | | 0.032 | 0.032 | 0.11 | N | Yes | 1 | WET |
| | Zinc | 7440-66-6 | T | MG/KG | 6.3 | | | 1.7 | 1.7 | 5.6 | Y | Yes | 1 | WET |
| SW-846 7473 | Mercury | 7439-97-6 | T | MG/KG | 0.12 | | | 0.0030 | 0.0030 | 0.019 | Y | Yes | 1 | WET |

**TVA TDEC Program**
**Facility: Cumberland Fossil Plant**
**SDG: 40182296**

| | |
|---|---|
| **Lab Sample ID** | 40182296004 |
| **Sys Sample Code** | CUF-FH-BG-WCD-F-20180510 |
| **Sample Name** | CUF-FH-BG-WCD-F-20180510 |
| **Sample Date** | 5/10/2018 10:18:00 AM |
| **Location** | WCD |
| **Sample Type** | N |
| **Parent Sample** | |

| Analytic Method | Chemical Name | CAS Rn | Fraction | Result Unit | Final Result | Final Qual | Reason code | Final MDL | Final RL | Final QL | Final Detect | Final Report | DF | Basis |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| ASTM D2974-87 | Percent Moisture | MOISTURE | N | % | 82.8 | | | 0.10 | 0.10 | 0.10 | Y | Yes | 1 | WET |
| SW-846 6020A | Antimony | 7440-36-0 | T | MG/KG | | U | | 0.016 | 0.016 | 0.096 | N | Yes | 1 | WET |
| | Arsenic | 7440-38-2 | T | MG/KG | | U | | 0.029 | 0.029 | 0.096 | N | Yes | 1 | WET |
| | Barium | 7440-39-3 | T | MG/KG | | U* | BE | 0.12 | 0.12 | 0.12 | N | Yes | 1 | WET |
| | Beryllium | 7440-41-7 | T | MG/KG | | U | | 0.032 | 0.032 | 0.11 | N | Yes | 1 | WET |
| | Boron | 7440-42-8 | T | MG/KG | | U | | 0.67 | 0.67 | 2.2 | N | Yes | 1 | WET |
| | Cadmium | 7440-43-9 | T | MG/KG | | U | | 0.014 | 0.014 | 0.096 | N | Yes | 1 | WET |
| | Calcium | 7440-70-2 | T | MG/KG | 770 | | | 24.4 | 24.4 | 81.2 | Y | Yes | 1 | WET |
| | Chromium | 7440-47-3 | T | MG/KG | | UJ | L- | 0.085 | 0.085 | 0.28 | N | Yes | 1 | WET |
| | Cobalt | 7440-48-4 | T | MG/KG | | U | | 0.0079 | 0.0079 | 0.096 | N | Yes | 1 | WET |
| | Copper | 7440-50-8 | T | MG/KG | | U* | BE | 0.44 | 0.44 | 0.91 | N | Yes | 1 | WET |
| | Lead | 7439-92-1 | T | MG/KG | | U | | 0.025 | 0.025 | 0.084 | N | Yes | 1 | WET |
| | Lithium | 7439-93-2 | T | MG/KG | | U | | 0.020 | 0.020 | 0.096 | N | Yes | 1 | WET |
| | Molybdenum | 7439-98-7 | T | MG/KG | | U | | 0.034 | 0.034 | 0.11 | N | Yes | 1 | WET |
| | Nickel | 7440-02-0 | T | MG/KG | 0.10 | J | RL | 0.039 | 0.039 | 0.13 | Y | Yes | 1 | WET |
| | Selenium | 7782-49-2 | T | MG/KG | 0.41 | | | 0.049 | 0.049 | 0.16 | Y | Yes | 1 | WET |
| | Silver | 7440-22-4 | T | MG/KG | | U | | 0.011 | 0.011 | 0.048 | N | Yes | 1 | WET |
| | Strontium | 7440-24-6 | T | MG/KG | 0.65 | | | 0.15 | 0.15 | 0.51 | Y | Yes | 1 | WET |
| | Thallium | 7440-28-0 | T | MG/KG | | U | | 0.012 | 0.012 | 0.096 | N | Yes | 1 | WET |
| | Vanadium | 7440-62-2 | T | MG/KG | | U | | 0.032 | 0.032 | 0.11 | N | Yes | 1 | WET |
| | Zinc | 7440-66-6 | T | MG/KG | 7.1 | | | 1.7 | 1.7 | 5.5 | Y | Yes | 1 | WET |
| SW-846 7473 | Mercury | 7439-97-6 | T | MG/KG | 0.092 | | | 0.0030 | 0.0030 | 0.019 | Y | Yes | 1 | WET |

**TVA TDEC Program**
**Facility: Cumberland Fossil Plant**
**SDG: 40182296**

| | |
|---|---|
| **Lab Sample ID** | 40182296005 |
| **Sys Sample Code** | CUF-FH-BG-WCU-F-20180508 |
| **Sample Name** | CUF-FH-BG-WCU-F-20180508 |
| **Sample Date** | 5/8/2018 6:08:00 PM |
| **Location** | WCU |
| **Sample Type** | N |
| **Parent Sample** | |

| Analytic Method | Chemical Name | CAS Rn | Fraction | Result Unit | Final Result | Final Qual | Reason code | Final MDL | Final RL | Final QL | Final Detect | Final Report | DF | Basis |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| ASTM D2974-87 | Percent Moisture | MOISTURE | N | % | 81.7 | | | 0.10 | 0.10 | 0.10 | Y | Yes | 1 | WET |
| SW-846 6020A | Antimony | 7440-36-0 | T | MG/KG | | U | | 0.015 | 0.015 | 0.093 | N | Yes | 1 | WET |
| | Arsenic | 7440-38-2 | T | MG/KG | | U | | 0.028 | 0.028 | 0.094 | N | Yes | 1 | WET |
| | Barium | 7440-39-3 | T | MG/KG | | U* | BE | 0.046 | 0.046 | 0.095 | N | Yes | 1 | WET |
| | Beryllium | 7440-41-7 | T | MG/KG | | U | | 0.031 | 0.031 | 0.10 | N | Yes | 1 | WET |
| | Boron | 7440-42-8 | T | MG/KG | | U | | 0.65 | 0.65 | 2.2 | N | Yes | 1 | WET |
| | Cadmium | 7440-43-9 | T | MG/KG | | U | | 0.013 | 0.013 | 0.093 | N | Yes | 1 | WET |
| | Calcium | 7440-70-2 | T | MG/KG | 363 | | | 23.6 | 23.6 | 78.8 | Y | Yes | 1 | WET |
| | Chromium | 7440-47-3 | T | MG/KG | | UJ | L- | 0.082 | 0.082 | 0.27 | N | Yes | 1 | WET |
| | Cobalt | 7440-48-4 | T | MG/KG | | U | | 0.0076 | 0.0076 | 0.093 | N | Yes | 1 | WET |
| | Copper | 7440-50-8 | T | MG/KG | | U | | 0.26 | 0.26 | 0.88 | N | Yes | 1 | WET |
| | Lead | 7439-92-1 | T | MG/KG | | U | | 0.024 | 0.024 | 0.081 | N | Yes | 1 | WET |
| | Lithium | 7439-93-2 | T | MG/KG | | U | | 0.020 | 0.020 | 0.093 | N | Yes | 1 | WET |
| | Molybdenum | 7439-98-7 | T | MG/KG | | U | | 0.033 | 0.033 | 0.11 | N | Yes | 1 | WET |
| | Nickel | 7440-02-0 | T | MG/KG | 0.043 | J | RL | 0.038 | 0.038 | 0.13 | Y | Yes | 1 | WET |
| | Selenium | 7782-49-2 | T | MG/KG | 0.41 | | | 0.047 | 0.047 | 0.16 | Y | Yes | 1 | WET |
| | Silver | 7440-22-4 | T | MG/KG | | U | | 0.010 | 0.010 | 0.047 | N | Yes | 1 | WET |
| | Strontium | 7440-24-6 | T | MG/KG | 0.27 | J | RL | 0.15 | 0.15 | 0.50 | Y | Yes | 1 | WET |
| | Thallium | 7440-28-0 | T | MG/KG | | U | | 0.012 | 0.012 | 0.093 | N | Yes | 1 | WET |
| | Vanadium | 7440-62-2 | T | MG/KG | | U | | 0.031 | 0.031 | 0.10 | N | Yes | 1 | WET |
| | Zinc | 7440-66-6 | T | MG/KG | 6.6 | | | 1.6 | 1.6 | 5.3 | Y | Yes | 1 | WET |
| SW-846 7473 | Mercury | 7439-97-6 | T | MG/KG | 0.082 | | | 0.0030 | 0.0030 | 0.019 | Y | Yes | 1 | WET |

**TVA TDEC Program**
**Facility: Cumberland Fossil Plant**
**SDG: 40182296**

| | |
|---|---|
| **Lab Sample ID** | 40182296006 |
| **Sys Sample Code** | CUF-FH-CC-CURD-F-20180509 |
| **Sample Name** | CUF-FH-CC-CURD-F-20180509 |
| **Sample Date** | 5/9/2018 5:50:00 PM |
| **Location** | CURD |
| **Sample Type** | N |
| **Parent Sample** | |

| Analytic Method | Chemical Name | CAS Rn | Fraction | Result Unit | Final Result | Final Qual | Reason code | Final MDL | Final RL | Final QL | Final Detect | Final Report | DF | Basis |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| ASTM D2974-87 | Percent Moisture | MOISTURE | N | % | 79.4 | | | 0.10 | 0.10 | 0.10 | Y | Yes | 1 | WET |
| SW-846 6020A | Antimony | 7440-36-0 | T | MG/KG | | U | | 0.016 | 0.016 | 0.10 | N | Yes | 1 | WET |
| | Arsenic | 7440-38-2 | T | MG/KG | | U | | 0.030 | 0.030 | 0.10 | N | Yes | 1 | WET |
| | Barium | 7440-39-3 | T | MG/KG | | U | | 0.031 | 0.031 | 0.10 | N | Yes | 1 | WET |
| | Beryllium | 7440-41-7 | T | MG/KG | | U | | 0.033 | 0.033 | 0.11 | N | Yes | 1 | WET |
| | Boron | 7440-42-8 | T | MG/KG | | U | | 0.70 | 0.70 | 2.3 | N | Yes | 1 | WET |
| | Cadmium | 7440-43-9 | T | MG/KG | | U | | 0.014 | 0.014 | 0.10 | N | Yes | 1 | WET |
| | Calcium | 7440-70-2 | T | MG/KG | 70.9 | J | RL | 25.4 | 25.4 | 84.7 | Y | Yes | 1 | WET |
| | Chromium | 7440-47-3 | T | MG/KG | | UJ | L- | 0.088 | 0.088 | 0.29 | N | Yes | 1 | WET |
| | Cobalt | 7440-48-4 | T | MG/KG | 0.010 | J | RL | 0.0082 | 0.0082 | 0.10 | Y | Yes | 1 | WET |
| | Copper | 7440-50-8 | T | MG/KG | | U* | BE | 0.30 | 0.30 | 0.95 | N | Yes | 1 | WET |
| | Lead | 7439-92-1 | T | MG/KG | | U | | 0.026 | 0.026 | 0.087 | N | Yes | 1 | WET |
| | Lithium | 7439-93-2 | T | MG/KG | | U | | 0.021 | 0.021 | 0.10 | N | Yes | 1 | WET |
| | Molybdenum | 7439-98-7 | T | MG/KG | | U | | 0.036 | 0.036 | 0.12 | N | Yes | 1 | WET |
| | Nickel | 7440-02-0 | T | MG/KG | | U | | 0.041 | 0.041 | 0.14 | N | Yes | 1 | WET |
| | Selenium | 7782-49-2 | T | MG/KG | 0.21 | | | 0.051 | 0.051 | 0.17 | Y | Yes | 1 | WET |
| | Silver | 7440-22-4 | T | MG/KG | | U | | 0.011 | 0.011 | 0.050 | N | Yes | 1 | WET |
| | Strontium | 7440-24-6 | T | MG/KG | | U | | 0.16 | 0.16 | 0.54 | N | Yes | 1 | WET |
| | Thallium | 7440-28-0 | T | MG/KG | | U | | 0.013 | 0.013 | 0.10 | N | Yes | 1 | WET |
| | Vanadium | 7440-62-2 | T | MG/KG | | U | | 0.033 | 0.033 | 0.11 | N | Yes | 1 | WET |
| | Zinc | 7440-66-6 | T | MG/KG | 6.1 | | | 1.7 | 1.7 | 5.7 | Y | Yes | 1 | WET |
| SW-846 7473 | Mercury | 7439-97-6 | T | MG/KG | 0.088 | | | 0.0029 | 0.0029 | 0.018 | Y | Yes | 1 | WET |

**TVA TDEC Program**
**Facility: Cumberland Fossil Plant**
**SDG: 40182296**

| | |
|---|---|
| **Lab Sample ID** | 40182296007 |
| **Sys Sample Code** | CUF-FH-CC-CURA-F-20180509 |
| **Sample Name** | CUF-FH-CC-CURA-F-20180509 |
| **Sample Date** | 5/9/2018 2:17:00 PM |
| **Location** | CURA |
| **Sample Type** | N |
| **Parent Sample** | |

| Analytic Method | Chemical Name | CAS Rn | Fraction | Result Unit | Final Result | Final Qual | Reason code | Final MDL | Final RL | Final QL | Final Detect | Final Report | DF | Basis |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| ASTM D2974-87 | Percent Moisture | MOISTURE | N | % | 80.3 | | | 0.10 | 0.10 | 0.10 | Y | Yes | 1 | WET |
| SW-846 6020A | Antimony | 7440-36-0 | T | MG/KG | | U | | 0.016 | 0.016 | 0.099 | N | Yes | 1 | WET |
| | Arsenic | 7440-38-2 | T | MG/KG | | U | | 0.030 | 0.030 | 0.099 | N | Yes | 1 | WET |
| | Barium | 7440-39-3 | T | MG/KG | | U | | 0.030 | 0.030 | 0.10 | N | Yes | 1 | WET |
| | Beryllium | 7440-41-7 | T | MG/KG | | U | | 0.033 | 0.033 | 0.11 | N | Yes | 1 | WET |
| | Boron | 7440-42-8 | T | MG/KG | | U | | 0.69 | 0.69 | 2.3 | N | Yes | 1 | WET |
| | Cadmium | 7440-43-9 | T | MG/KG | | U | | 0.014 | 0.014 | 0.099 | N | Yes | 1 | WET |
| | Calcium | 7440-70-2 | T | MG/KG | 552 | | | 25.1 | 25.1 | 83.5 | Y | Yes | 1 | WET |
| | Chromium | 7440-47-3 | T | MG/KG | | UJ | L- | 0.087 | 0.087 | 0.29 | N | Yes | 1 | WET |
| | Cobalt | 7440-48-4 | T | MG/KG | 0.0081 | J | RL | 0.0081 | 0.0081 | 0.099 | Y | Yes | 1 | WET |
| | Copper | 7440-50-8 | T | MG/KG | | U* | BE | 0.32 | 0.32 | 0.94 | N | Yes | 1 | WET |
| | Lead | 7439-92-1 | T | MG/KG | | U | | 0.026 | 0.026 | 0.086 | N | Yes | 1 | WET |
| | Lithium | 7439-93-2 | T | MG/KG | | U | | 0.021 | 0.021 | 0.099 | N | Yes | 1 | WET |
| | Molybdenum | 7439-98-7 | T | MG/KG | | U | | 0.035 | 0.035 | 0.12 | N | Yes | 1 | WET |
| | Nickel | 7440-02-0 | T | MG/KG | 0.055 | J | RL | 0.041 | 0.041 | 0.14 | Y | Yes | 1 | WET |
| | Selenium | 7782-49-2 | T | MG/KG | 0.17 | | | 0.050 | 0.050 | 0.17 | Y | Yes | 1 | WET |
| | Silver | 7440-22-4 | T | MG/KG | | U | | 0.011 | 0.011 | 0.049 | N | Yes | 1 | WET |
| | Strontium | 7440-24-6 | T | MG/KG | 0.36 | J | RL | 0.16 | 0.16 | 0.53 | Y | Yes | 1 | WET |
| | Thallium | 7440-28-0 | T | MG/KG | | U | | 0.013 | 0.013 | 0.099 | N | Yes | 1 | WET |
| | Vanadium | 7440-62-2 | T | MG/KG | | U | | 0.033 | 0.033 | 0.11 | N | Yes | 1 | WET |
| | Zinc | 7440-66-6 | T | MG/KG | 6.3 | | | 1.7 | 1.7 | 5.7 | Y | Yes | 1 | WET |
| SW-846 7473 | Mercury | 7439-97-6 | T | MG/KG | 0.18 | J | C | 0.0031 | 0.0031 | 0.019 | Y | Yes | 1 | WET |

**TVA TDEC Program**
**Facility: Cumberland Fossil Plant**
**SDG: 40182296**

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|---|---|
| **Lab Sample ID** | 40182296008 |
| **Sys Sample Code** | CUF-FH-CC-CURU-F-20180502 |
| **Sample Name** | CUF-FH-CC-CURU-F-20180502 |
| **Sample Date** | 5/2/2018 1:00:00 PM |
| **Location** | CURU |
| **Sample Type** | N |
| **Parent Sample** | |

| Analytic Method | Chemical Name | CAS Rn | Fraction | Result Unit | Final Result | Final Qual | Reason code | Final MDL | Final RL | Final QL | Final Detect | Final Report | DF | Basis |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| ASTM D2974-87 | Percent Moisture | MOISTURE | N | % | 80.1 | | | 0.10 | 0.10 | 0.10 | Y | Yes | 1 | WET |
| SW-846 6020A | Antimony | 7440-36-0 | T | MG/KG | | U | | 0.016 | 0.016 | 0.098 | N | Yes | 1 | WET |
| | Arsenic | 7440-38-2 | T | MG/KG | | U | | 0.029 | 0.029 | 0.098 | N | Yes | 1 | WET |
| | Barium | 7440-39-3 | T | MG/KG | | U | | 0.030 | 0.030 | 0.099 | N | Yes | 1 | WET |
| | Beryllium | 7440-41-7 | T | MG/KG | | U | | 0.032 | 0.032 | 0.11 | N | Yes | 1 | WET |
| | Boron | 7440-42-8 | T | MG/KG | | U | | 0.68 | 0.68 | 2.3 | N | Yes | 1 | WET |
| | Cadmium | 7440-43-9 | T | MG/KG | | U | | 0.014 | 0.014 | 0.098 | N | Yes | 1 | WET |
| | Calcium | 7440-70-2 | T | MG/KG | 74.1 | J | RL | 24.8 | 24.8 | 82.6 | Y | Yes | 1 | WET |
| | Chromium | 7440-47-3 | T | MG/KG | | UJ | L- | 0.086 | 0.086 | 0.29 | N | Yes | 1 | WET |
| | Cobalt | 7440-48-4 | T | MG/KG | 0.0094 | J | RL | 0.0080 | 0.0080 | 0.098 | Y | Yes | 1 | WET |
| | Copper | 7440-50-8 | T | MG/KG | | U* | BE | 0.28 | 0.28 | 0.92 | N | Yes | 1 | WET |
| | Lead | 7439-92-1 | T | MG/KG | | U | | 0.026 | 0.026 | 0.085 | N | Yes | 1 | WET |
| | Lithium | 7439-93-2 | T | MG/KG | | U | | 0.020 | 0.020 | 0.098 | N | Yes | 1 | WET |
| | Molybdenum | 7439-98-7 | T | MG/KG | | U | | 0.035 | 0.035 | 0.12 | N | Yes | 1 | WET |
| | Nickel | 7440-02-0 | T | MG/KG | | U | | 0.040 | 0.040 | 0.13 | N | Yes | 1 | WET |
| | Selenium | 7782-49-2 | T | MG/KG | 0.23 | | | 0.049 | 0.049 | 0.16 | Y | Yes | 1 | WET |
| | Silver | 7440-22-4 | T | MG/KG | | U | | 0.011 | 0.011 | 0.049 | N | Yes | 1 | WET |
| | Strontium | 7440-24-6 | T | MG/KG | | U | | 0.16 | 0.16 | 0.52 | N | Yes | 1 | WET |
| | Thallium | 7440-28-0 | T | MG/KG | | U | | 0.013 | 0.013 | 0.098 | N | Yes | 1 | WET |
| | Vanadium | 7440-62-2 | T | MG/KG | | U | | 0.032 | 0.032 | 0.11 | N | Yes | 1 | WET |
| | Zinc | 7440-66-6 | T | MG/KG | 5.6 | | | 1.7 | 1.7 | 5.6 | Y | Yes | 1 | WET |
| SW-846 7473 | Mercury | 7439-97-6 | T | MG/KG | 0.12 | | | 0.0030 | 0.0030 | 0.019 | Y | Yes | 1 | WET |

**TVA TDEC Program**
**Facility: Cumberland Fossil Plant**
**SDG: 40182296**

| | |
|---|---|
| **Lab Sample ID** | 40182296009 |
| **Sys Sample Code** | CUF-FH-CC-WCD-F-20180410 |
| **Sample Name** | CUF-FH-CC-WCD-F-20180410 |
| **Sample Date** | 4/10/2018 5:15:00 PM |
| **Location** | WCD |
| **Sample Type** | N |
| **Parent Sample** | |

| Analytic Method | Chemical Name | CAS Rn | Fraction | Result Unit | Final Result | Final Qual | Reason code | Final MDL | Final RL | Final QL | Final Detect | Final Report | DF | Basis |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| ASTM D2974-87 | Percent Moisture | MOISTURE | N | % | 77.3 | | | 0.10 | 0.10 | 0.10 | Y | Yes | 1 | WET |
| SW-846 6020A | Antimony | 7440-36-0 | T | MG/KG | | U | | 0.016 | 0.016 | 0.10 | N | Yes | 1 | WET |
| | Arsenic | 7440-38-2 | T | MG/KG | | U | | 0.030 | 0.030 | 0.10 | N | Yes | 1 | WET |
| | Barium | 7440-39-3 | T | MG/KG | | U | | 0.030 | 0.030 | 0.10 | N | Yes | 1 | WET |
| | Beryllium | 7440-41-7 | T | MG/KG | | U | | 0.033 | 0.033 | 0.11 | N | Yes | 1 | WET |
| | Boron | 7440-42-8 | T | MG/KG | | U | | 0.70 | 0.70 | 2.3 | N | Yes | 1 | WET |
| | Cadmium | 7440-43-9 | T | MG/KG | | U | | 0.014 | 0.014 | 0.10 | N | Yes | 1 | WET |
| | Calcium | 7440-70-2 | T | MG/KG | 62.2 | J | RL | 25.3 | 25.3 | 84.4 | Y | Yes | 1 | WET |
| | Chromium | 7440-47-3 | T | MG/KG | | UJ | L- | 0.088 | 0.088 | 0.29 | N | Yes | 1 | WET |
| | Cobalt | 7440-48-4 | T | MG/KG | | U | | 0.0082 | 0.0082 | 0.10 | N | Yes | 1 | WET |
| | Copper | 7440-50-8 | T | MG/KG | | U* | BE | 0.46 | 0.46 | 0.94 | N | Yes | 1 | WET |
| | Lead | 7439-92-1 | T | MG/KG | | U | | 0.026 | 0.026 | 0.087 | N | Yes | 1 | WET |
| | Lithium | 7439-93-2 | T | MG/KG | | U | | 0.021 | 0.021 | 0.10 | N | Yes | 1 | WET |
| | Molybdenum | 7439-98-7 | T | MG/KG | | U | | 0.036 | 0.036 | 0.12 | N | Yes | 1 | WET |
| | Nickel | 7440-02-0 | T | MG/KG | 0.085 | J | RL | 0.041 | 0.041 | 0.14 | Y | Yes | 1 | WET |
| | Selenium | 7782-49-2 | T | MG/KG | 0.34 | | | 0.051 | 0.051 | 0.17 | Y | Yes | 1 | WET |
| | Silver | 7440-22-4 | T | MG/KG | | U | | 0.011 | 0.011 | 0.050 | N | Yes | 1 | WET |
| | Strontium | 7440-24-6 | T | MG/KG | | U | | 0.16 | 0.16 | 0.53 | N | Yes | 1 | WET |
| | Thallium | 7440-28-0 | T | MG/KG | | U | | 0.013 | 0.013 | 0.10 | N | Yes | 1 | WET |
| | Vanadium | 7440-62-2 | T | MG/KG | | U | | 0.033 | 0.033 | 0.11 | N | Yes | 1 | WET |
| | Zinc | 7440-66-6 | T | MG/KG | 6.0 | | | 1.7 | 1.7 | 5.7 | Y | Yes | 1 | WET |
| SW-846 7473 | Mercury | 7439-97-6 | T | MG/KG | 0.16 | J | C | 0.0030 | 0.0030 | 0.019 | Y | Yes | 1 | WET |

**TVA TDEC Program**
**Facility: Cumberland Fossil Plant**
**SDG: 40182296**

| | |
|---|---|
| **Lab Sample ID** | 40182296010 |
| **Sys Sample Code** | CUF-FH-CC-WCU-F-20180410 |
| **Sample Name** | CUF-FH-CC-WCU-F-20180410 |
| **Sample Date** | 4/10/2018 3:30:00 PM |
| **Location** | WCU |
| **Sample Type** | N |
| **Parent Sample** | |

| Analytic Method | Chemical Name | CAS Rn | Fraction | Result Unit | Final Result | Final Qual | Reason code | Final MDL | Final RL | Final QL | Final Detect | Final Report | DF | Basis |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| ASTM D2974-87 | Percent Moisture | MOISTURE | N | % | 78.7 | | | 0.10 | 0.10 | 0.10 | Y | Yes | 1 | WET |
| SW-846 6020A | Antimony | 7440-36-0 | T | MG/KG | | U | | 0.016 | 0.016 | 0.098 | N | Yes | 1 | WET |
| | Arsenic | 7440-38-2 | T | MG/KG | | U | | 0.030 | 0.030 | 0.099 | N | Yes | 1 | WET |
| | Barium | 7440-39-3 | T | MG/KG | | U | | 0.030 | 0.030 | 0.10 | N | Yes | 1 | WET |
| | Beryllium | 7440-41-7 | T | MG/KG | | U | | 0.033 | 0.033 | 0.11 | N | Yes | 1 | WET |
| | Boron | 7440-42-8 | T | MG/KG | | U | | 0.69 | 0.69 | 2.3 | N | Yes | 1 | WET |
| | Cadmium | 7440-43-9 | T | MG/KG | | U | | 0.014 | 0.014 | 0.098 | N | Yes | 1 | WET |
| | Calcium | 7440-70-2 | T | MG/KG | 247 | | | 25.0 | 25.0 | 83.2 | Y | Yes | 1 | WET |
| | Chromium | 7440-47-3 | T | MG/KG | | UJ | L- | 0.087 | 0.087 | 0.29 | N | Yes | 1 | WET |
| | Cobalt | 7440-48-4 | T | MG/KG | | U | | 0.0081 | 0.0081 | 0.098 | N | Yes | 1 | WET |
| | Copper | 7440-50-8 | T | MG/KG | | U* | BE | 0.34 | 0.34 | 0.93 | N | Yes | 1 | WET |
| | Lead | 7439-92-1 | T | MG/KG | | U | | 0.026 | 0.026 | 0.086 | N | Yes | 1 | WET |
| | Lithium | 7439-93-2 | T | MG/KG | | U | | 0.021 | 0.021 | 0.098 | N | Yes | 1 | WET |
| | Molybdenum | 7439-98-7 | T | MG/KG | | U | | 0.035 | 0.035 | 0.12 | N | Yes | 1 | WET |
| | Nickel | 7440-02-0 | T | MG/KG | | U | | 0.040 | 0.040 | 0.13 | N | Yes | 1 | WET |
| | Selenium | 7782-49-2 | T | MG/KG | 0.22 | | | 0.050 | 0.050 | 0.17 | Y | Yes | 1 | WET |
| | Silver | 7440-22-4 | T | MG/KG | | U | | 0.011 | 0.011 | 0.049 | N | Yes | 1 | WET |
| | Strontium | 7440-24-6 | T | MG/KG | 0.22 | J | RL | 0.16 | 0.16 | 0.53 | Y | Yes | 1 | WET |
| | Thallium | 7440-28-0 | T | MG/KG | | U | | 0.013 | 0.013 | 0.098 | N | Yes | 1 | WET |
| | Vanadium | 7440-62-2 | T | MG/KG | | U | | 0.033 | 0.033 | 0.11 | N | Yes | 1 | WET |
| | Zinc | 7440-66-6 | T | MG/KG | 7.0 | | | 1.7 | 1.7 | 5.7 | Y | Yes | 1 | WET |
| SW-846 7473 | Mercury | 7439-97-6 | T | MG/KG | 0.18 | J | C | 0.0032 | 0.0032 | 0.020 | Y | Yes | 1 | WET |

**TVA TDEC Program**
**Facility: Cumberland Fossil Plant**
**SDG: 40182296**

| | |
|---|---|
| **Lab Sample ID** | 40182296011 |
| **Sys Sample Code** | CUF-FH-LB-CURD-F-20180410 |
| **Sample Name** | CUF-FH-LB-CURD-F-20180410 |
| **Sample Date** | 4/10/2018 1:25:00 PM |
| **Location** | CURD |
| **Sample Type** | N |
| **Parent Sample** | |

| Analytic Method | Chemical Name | CAS Rn | Fraction | Result Unit | Final Result | Final Qual | Reason code | Final MDL | Final RL | Final QL | Final Detect | Final Report | DF | Basis |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| ASTM D2974-87 | Percent Moisture | MOISTURE | N | % | 81.2 | | | 0.10 | 0.10 | 0.10 | Y | Yes | 1 | WET |
| SW-846 6020A | Antimony | 7440-36-0 | T | MG/KG | | U | | 0.016 | 0.016 | 0.098 | N | Yes | 1 | WET |
| | Arsenic | 7440-38-2 | T | MG/KG | | U* | BE | 0.10 | 0.10 | 0.10 | N | Yes | 1 | WET |
| | Barium | 7440-39-3 | T | MG/KG | | U | | 0.030 | 0.030 | 0.10 | N | Yes | 1 | WET |
| | Beryllium | 7440-41-7 | T | MG/KG | | U | | 0.033 | 0.033 | 0.11 | N | Yes | 1 | WET |
| | Boron | 7440-42-8 | T | MG/KG | | U | | 0.69 | 0.69 | 2.3 | N | Yes | 1 | WET |
| | Cadmium | 7440-43-9 | T | MG/KG | | U | | 0.014 | 0.014 | 0.098 | N | Yes | 1 | WET |
| | Calcium | 7440-70-2 | T | MG/KG | 364 | | | 25.0 | 25.0 | 83.2 | Y | Yes | 1 | WET |
| | Chromium | 7440-47-3 | T | MG/KG | | UJ | L- | 0.087 | 0.087 | 0.29 | N | Yes | 1 | WET |
| | Cobalt | 7440-48-4 | T | MG/KG | | U | | 0.0081 | 0.0081 | 0.098 | N | Yes | 1 | WET |
| | Copper | 7440-50-8 | T | MG/KG | | U | | 0.28 | 0.28 | 0.93 | N | Yes | 1 | WET |
| | Lead | 7439-92-1 | T | MG/KG | | U | | 0.026 | 0.026 | 0.086 | N | Yes | 1 | WET |
| | Lithium | 7439-93-2 | T | MG/KG | | U | | 0.021 | 0.021 | 0.098 | N | Yes | 1 | WET |
| | Molybdenum | 7439-98-7 | T | MG/KG | | U | | 0.035 | 0.035 | 0.12 | N | Yes | 1 | WET |
| | Nickel | 7440-02-0 | T | MG/KG | | U | | 0.040 | 0.040 | 0.13 | N | Yes | 1 | WET |
| | Selenium | 7782-49-2 | T | MG/KG | 0.32 | | | 0.050 | 0.050 | 0.17 | Y | Yes | 1 | WET |
| | Silver | 7440-22-4 | T | MG/KG | | U | | 0.011 | 0.011 | 0.049 | N | Yes | 1 | WET |
| | Strontium | 7440-24-6 | T | MG/KG | 0.24 | J | RL | 0.16 | 0.16 | 0.53 | Y | Yes | 1 | WET |
| | Thallium | 7440-28-0 | T | MG/KG | | U | | 0.013 | 0.013 | 0.098 | N | Yes | 1 | WET |
| | Vanadium | 7440-62-2 | T | MG/KG | | U | | 0.033 | 0.033 | 0.11 | N | Yes | 1 | WET |
| | Zinc | 7440-66-6 | T | MG/KG | 4.3 | J | RL | 1.7 | 1.7 | 5.7 | Y | Yes | 1 | WET |
| SW-846 7473 | Mercury | 7439-97-6 | T | MG/KG | 0.24 | | | 0.0030 | 0.0030 | 0.019 | Y | Yes | 1 | WET |

| | |
|---|---|
| **Lab Sample ID** | 40182296012 |
| **Sys Sample Code** | CUF-FH-LB-CURA-F-20180410 |
| **Sample Name** | CUF-FH-LB-CURA-F-20180410 |
| **Sample Date** | 4/10/2018 11:15:00 AM |
| **Location** | CURA |
| **Sample Type** | N |
| **Parent Sample** | |

| Analytic Method | Chemical Name | CAS Rn | Fraction | Result Unit | Final Result | Final Qual | Reason code | Final MDL | Final RL | Final QL | Final Detect | Final Report | DF | Basis |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| ASTM D2974-87 | Percent Moisture | MOISTURE | N | % | 81.4 | | | 0.10 | 0.10 | 0.10 | Y | Yes | 1 | WET |
| SW-846 6020A | Antimony | 7440-36-0 | T | MG/KG | | U | | 0.015 | 0.015 | 0.093 | N | Yes | 1 | WET |
| | Arsenic | 7440-38-2 | T | MG/KG | | U* | BE | 0.088 | 0.088 | 0.094 | N | Yes | 1 | WET |
| | Barium | 7440-39-3 | T | MG/KG | | U | | 0.029 | 0.029 | 0.095 | N | Yes | 1 | WET |
| | Beryllium | 7440-41-7 | T | MG/KG | | U | | 0.031 | 0.031 | 0.10 | N | Yes | 1 | WET |
| | Boron | 7440-42-8 | T | MG/KG | | U | | 0.65 | 0.65 | 2.2 | N | Yes | 1 | WET |
| | Cadmium | 7440-43-9 | T | MG/KG | | U | | 0.013 | 0.013 | 0.093 | N | Yes | 1 | WET |
| | Calcium | 7440-70-2 | T | MG/KG | 187 | | | 23.7 | 23.7 | 79.1 | Y | Yes | 1 | WET |
| | Chromium | 7440-47-3 | T | MG/KG | | UJ | L- | 0.083 | 0.083 | 0.28 | N | Yes | 1 | WET |
| | Cobalt | 7440-48-4 | T | MG/KG | | U | | 0.0077 | 0.0077 | 0.093 | N | Yes | 1 | WET |
| | Copper | 7440-50-8 | T | MG/KG | | U | | 0.27 | 0.27 | 0.89 | N | Yes | 1 | WET |
| | Lead | 7439-92-1 | T | MG/KG | | U | | 0.024 | 0.024 | 0.082 | N | Yes | 1 | WET |
| | Lithium | 7439-93-2 | T | MG/KG | | U | | 0.020 | 0.020 | 0.093 | N | Yes | 1 | WET |
| | Molybdenum | 7439-98-7 | T | MG/KG | | U | | 0.033 | 0.033 | 0.11 | N | Yes | 1 | WET |
| | Nickel | 7440-02-0 | T | MG/KG | | U | | 0.038 | 0.038 | 0.13 | N | Yes | 1 | WET |
| | Selenium | 7782-49-2 | T | MG/KG | 0.33 | | | 0.047 | 0.047 | 0.16 | Y | Yes | 1 | WET |
| | Silver | 7440-22-4 | T | MG/KG | | U | | 0.010 | 0.010 | 0.047 | N | Yes | 1 | WET |
| | Strontium | 7440-24-6 | T | MG/KG | | U | | 0.15 | 0.15 | 0.50 | N | Yes | 1 | WET |
| | Thallium | 7440-28-0 | T | MG/KG | | U | | 0.012 | 0.012 | 0.093 | N | Yes | 1 | WET |
| | Vanadium | 7440-62-2 | T | MG/KG | | U | | 0.031 | 0.031 | 0.10 | N | Yes | 1 | WET |
| | Zinc | 7440-66-6 | T | MG/KG | 3.6 | J | RL | 1.6 | 1.6 | 5.4 | Y | Yes | 1 | WET |
| SW-846 7473 | Mercury | 7439-97-6 | T | MG/KG | 0.25 | | | 0.0030 | 0.0030 | 0.019 | Y | Yes | 1 | WET |

**TVA TDEC Program**
**Facility: Cumberland Fossil Plant**
**SDG: 40182296**

| | |
|---|---|
| **Lab Sample ID** | 40182296013 |
| **Sys Sample Code** | CUF-FH-LB-CURU-F-20180509 |
| **Sample Name** | CUF-FH-LB-CURU-F-20180509 |
| **Sample Date** | 5/9/2018 11:20:00 AM |
| **Location** | CURU |
| **Sample Type** | N |
| **Parent Sample** | |

| Analytic Method | Chemical Name | CAS Rn | Fraction | Result Unit | Final Result | Final Qual | Reason code | Final MDL | Final RL | Final QL | Final Detect | Final Report | DF | Basis |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| ASTM D2974-87 | Percent Moisture | MOISTURE | N | % | 82.8 | | | 0.10 | 0.10 | 0.10 | Y | Yes | 1 | WET |
| SW-846 6020A | Antimony | 7440-36-0 | T | MG/KG | | U | | 0.015 | 0.015 | 0.094 | N | Yes | 1 | WET |
| | Arsenic | 7440-38-2 | T | MG/KG | | U* | BE | 0.070 | 0.070 | 0.095 | N | Yes | 1 | WET |
| | Barium | 7440-39-3 | T | MG/KG | | U | | 0.029 | 0.029 | 0.096 | N | Yes | 1 | WET |
| | Beryllium | 7440-41-7 | T | MG/KG | | U | | 0.031 | 0.031 | 0.10 | N | Yes | 1 | WET |
| | Boron | 7440-42-8 | T | MG/KG | | U | | 0.66 | 0.66 | 2.2 | N | Yes | 1 | WET |
| | Cadmium | 7440-43-9 | T | MG/KG | | U | | 0.013 | 0.013 | 0.094 | N | Yes | 1 | WET |
| | Calcium | 7440-70-2 | T | MG/KG | 125 | | | 24.0 | 24.0 | 79.9 | Y | Yes | 1 | WET |
| | Chromium | 7440-47-3 | T | MG/KG | | UJ | L- | 0.084 | 0.084 | 0.28 | N | Yes | 1 | WET |
| | Cobalt | 7440-48-4 | T | MG/KG | | U | | 0.0077 | 0.0077 | 0.094 | N | Yes | 1 | WET |
| | Copper | 7440-50-8 | T | MG/KG | | U | | 0.27 | 0.27 | 0.89 | N | Yes | 1 | WET |
| | Lead | 7439-92-1 | T | MG/KG | | U | | 0.025 | 0.025 | 0.082 | N | Yes | 1 | WET |
| | Lithium | 7439-93-2 | T | MG/KG | | U | | 0.020 | 0.020 | 0.094 | N | Yes | 1 | WET |
| | Molybdenum | 7439-98-7 | T | MG/KG | | U | | 0.034 | 0.034 | 0.11 | N | Yes | 1 | WET |
| | Nickel | 7440-02-0 | T | MG/KG | | U | | 0.039 | 0.039 | 0.13 | N | Yes | 1 | WET |
| | Selenium | 7782-49-2 | T | MG/KG | 0.26 | | | 0.048 | 0.048 | 0.16 | Y | Yes | 1 | WET |
| | Silver | 7440-22-4 | T | MG/KG | | U | | 0.011 | 0.011 | 0.047 | N | Yes | 1 | WET |
| | Strontium | 7440-24-6 | T | MG/KG | | U | | 0.15 | 0.15 | 0.51 | N | Yes | 1 | WET |
| | Thallium | 7440-28-0 | T | MG/KG | | U | | 0.012 | 0.012 | 0.094 | N | Yes | 1 | WET |
| | Vanadium | 7440-62-2 | T | MG/KG | | U | | 0.031 | 0.031 | 0.10 | N | Yes | 1 | WET |
| | Zinc | 7440-66-6 | T | MG/KG | 3.8 | J | RL | 1.6 | 1.6 | 5.4 | Y | Yes | 1 | WET |
| SW-846 7473 | Mercury | 7439-97-6 | T | MG/KG | 0.27 | | | 0.0031 | 0.0031 | 0.019 | Y | Yes | 1 | WET |

**TVA TDEC Program**
**Facility: Cumberland Fossil Plant**
**SDG: 40182296**

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|---|---|
| **Lab Sample ID** | 40182296014 |
| **Sys Sample Code** | CUF-FH-LB-WCD-F-20180410 |
| **Sample Name** | CUF-FH-LB-WCD-F-20180410 |
| **Sample Date** | 4/10/2018 5:15:00 PM |
| **Location** | WCD |
| **Sample Type** | N |
| **Parent Sample** | |

| Analytic Method | Chemical Name | CAS Rn | Fraction | Result Unit | Final Result | Final Qual | Reason code | Final MDL | Final RL | Final QL | Final Detect | Final Report | DF | Basis |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| ASTM D2974-87 | Percent Moisture | MOISTURE | N | % | 81.7 | | | 0.10 | 0.10 | 0.10 | Y | Yes | 1 | WET |
| SW-846 6020A | Antimony | 7440-36-0 | T | MG/KG | | U | | 0.016 | 0.016 | 0.099 | N | Yes | 1 | WET |
| | Arsenic | 7440-38-2 | T | MG/KG | | U* | BE | 0.10 | 0.10 | 0.10 | N | Yes | 1 | WET |
| | Barium | 7440-39-3 | T | MG/KG | | U* | BE | 0.041 | 0.041 | 0.10 | N | Yes | 1 | WET |
| | Beryllium | 7440-41-7 | T | MG/KG | | U | | 0.033 | 0.033 | 0.11 | N | Yes | 1 | WET |
| | Boron | 7440-42-8 | T | MG/KG | | U | | 0.69 | 0.69 | 2.3 | N | Yes | 1 | WET |
| | Cadmium | 7440-43-9 | T | MG/KG | | U | | 0.014 | 0.014 | 0.099 | N | Yes | 1 | WET |
| | Calcium | 7440-70-2 | T | MG/KG | 192 | | | 25.2 | 25.2 | 84.0 | Y | Yes | 1 | WET |
| | Chromium | 7440-47-3 | T | MG/KG | | UJ | L- | 0.088 | 0.088 | 0.29 | N | Yes | 1 | WET |
| | Cobalt | 7440-48-4 | T | MG/KG | | U | | 0.0081 | 0.0081 | 0.099 | N | Yes | 1 | WET |
| | Copper | 7440-50-8 | T | MG/KG | | U* | BE | 0.36 | 0.36 | 0.94 | N | Yes | 1 | WET |
| | Lead | 7439-92-1 | T | MG/KG | | U | | 0.026 | 0.026 | 0.087 | N | Yes | 1 | WET |
| | Lithium | 7439-93-2 | T | MG/KG | | U | | 0.021 | 0.021 | 0.099 | N | Yes | 1 | WET |
| | Molybdenum | 7439-98-7 | T | MG/KG | | U | | 0.036 | 0.036 | 0.12 | N | Yes | 1 | WET |
| | Nickel | 7440-02-0 | T | MG/KG | | U | | 0.041 | 0.041 | 0.14 | N | Yes | 1 | WET |
| | Selenium | 7782-49-2 | T | MG/KG | 0.32 | | | 0.050 | 0.050 | 0.17 | Y | Yes | 1 | WET |
| | Silver | 7440-22-4 | T | MG/KG | | U | | 0.011 | 0.011 | 0.050 | N | Yes | 1 | WET |
| | Strontium | 7440-24-6 | T | MG/KG | | U | | 0.16 | 0.16 | 0.53 | N | Yes | 1 | WET |
| | Thallium | 7440-28-0 | T | MG/KG | | U | | 0.013 | 0.013 | 0.099 | N | Yes | 1 | WET |
| | Vanadium | 7440-62-2 | T | MG/KG | | U | | 0.033 | 0.033 | 0.11 | N | Yes | 1 | WET |
| | Zinc | 7440-66-6 | T | MG/KG | 4.0 | J | RL | 1.7 | 1.7 | 5.7 | Y | Yes | 1 | WET |
| SW-846 7473 | Mercury | 7439-97-6 | T | MG/KG | 0.24 | | | 0.0030 | 0.0030 | 0.019 | Y | Yes | 1 | WET |

**TVA TDEC Program**
**Facility: Cumberland Fossil Plant**
**SDG: 40182296**

| | |
|---|---|
| **Lab Sample ID** | 40182296015 |
| **Sys Sample Code** | CUF-FH-LB-WCU-F-20180410 |
| **Sample Name** | CUF-FH-LB-WCU-F-20180410 |
| **Sample Date** | 4/10/2018 3:30:00 PM |
| **Location** | WCU |
| **Sample Type** | N |
| **Parent Sample** | |

| Analytic Method | Chemical Name | CAS Rn | Fraction | Result Unit | Final Result | Final Qual | Reason code | Final MDL | Final RL | Final QL | Final Detect | Final Report | DF | Basis |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| ASTM D2974-87 | Percent Moisture | MOISTURE | N | % | 80.6 | | | 0.10 | 0.10 | 0.10 | Y | Yes | 1 | WET |
| SW-846 6020A | Antimony | 7440-36-0 | T | MG/KG | | U | | 0.016 | 0.016 | 0.097 | N | Yes | 1 | WET |
| | Arsenic | 7440-38-2 | T | MG/KG | | U* | BE | 0.080 | 0.080 | 0.098 | N | Yes | 1 | WET |
| | Barium | 7440-39-3 | T | MG/KG | | U | | 0.030 | 0.030 | 0.099 | N | Yes | 1 | WET |
| | Beryllium | 7440-41-7 | T | MG/KG | | U | | 0.032 | 0.032 | 0.11 | N | Yes | 1 | WET |
| | Boron | 7440-42-8 | T | MG/KG | | U | | 0.68 | 0.68 | 2.3 | N | Yes | 1 | WET |
| | Cadmium | 7440-43-9 | T | MG/KG | | U | | 0.014 | 0.014 | 0.097 | N | Yes | 1 | WET |
| | Calcium | 7440-70-2 | T | MG/KG | 216 | | | 24.6 | 24.6 | 82.1 | Y | Yes | 1 | WET |
| | Chromium | 7440-47-3 | T | MG/KG | | UJ | L- | 0.086 | 0.086 | 0.29 | N | Yes | 1 | WET |
| | Cobalt | 7440-48-4 | T | MG/KG | | U | | 0.0080 | 0.0080 | 0.097 | N | Yes | 1 | WET |
| | Copper | 7440-50-8 | T | MG/KG | | U | | 0.28 | 0.28 | 0.92 | N | Yes | 1 | WET |
| | Lead | 7439-92-1 | T | MG/KG | | U | | 0.025 | 0.025 | 0.085 | N | Yes | 1 | WET |
| | Lithium | 7439-93-2 | T | MG/KG | | U | | 0.020 | 0.020 | 0.097 | N | Yes | 1 | WET |
| | Molybdenum | 7439-98-7 | T | MG/KG | | U | | 0.035 | 0.035 | 0.12 | N | Yes | 1 | WET |
| | Nickel | 7440-02-0 | T | MG/KG | | U | | 0.040 | 0.040 | 0.13 | N | Yes | 1 | WET |
| | Selenium | 7782-49-2 | T | MG/KG | 0.30 | | | 0.049 | 0.049 | 0.16 | Y | Yes | 1 | WET |
| | Silver | 7440-22-4 | T | MG/KG | | U | | 0.011 | 0.011 | 0.048 | N | Yes | 1 | WET |
| | Strontium | 7440-24-6 | T | MG/KG | | U | | 0.16 | 0.16 | 0.52 | N | Yes | 1 | WET |
| | Thallium | 7440-28-0 | T | MG/KG | | U | | 0.013 | 0.013 | 0.097 | N | Yes | 1 | WET |
| | Vanadium | 7440-62-2 | T | MG/KG | | U | | 0.032 | 0.032 | 0.11 | N | Yes | 1 | WET |
| | Zinc | 7440-66-6 | T | MG/KG | 3.8 | J | RL | 1.7 | 1.7 | 5.6 | Y | Yes | 1 | WET |
| SW-846 7473 | Mercury | 7439-97-6 | T | MG/KG | 0.32 | | | 0.0029 | 0.0029 | 0.018 | Y | Yes | 1 | WET |

**TVA TDEC Program**
**Facility: Cumberland Fossil Plant**
**SDG: 40182296**

| | |
|---|---|
| **Lab Sample ID** | 40182296016 |
| **Sys Sample Code** | CUF-FH-RS-CURD-F-20180509 |
| **Sample Name** | CUF-FH-RS-CURD-F-20180509 |
| **Sample Date** | 5/9/2018 5:50:00 PM |
| **Location** | CURD |
| **Sample Type** | N |
| **Parent Sample** | |

| Analytic Method | Chemical Name | CAS Rn | Fraction | Result Unit | Final Result | Final Qual | Reason code | Final MDL | Final RL | Final QL | Final Detect | Final Report | DF | Basis |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| ASTM D2974-87 | Percent Moisture | MOISTURE | N | % | 81.4 | | | 0.10 | 0.10 | 0.10 | Y | Yes | 1 | WET |
| SW-846 6020A | Antimony | 7440-36-0 | T | MG/KG | | U | | 0.016 | 0.016 | 0.097 | N | Yes | 1 | WET |
| | Arsenic | 7440-38-2 | T | MG/KG | | U* | BE | 0.10 | 0.10 | 0.10 | N | Yes | 1 | WET |
| | Barium | 7440-39-3 | T | MG/KG | | U | | 0.030 | 0.030 | 0.099 | N | Yes | 1 | WET |
| | Beryllium | 7440-41-7 | T | MG/KG | | U | | 0.032 | 0.032 | 0.11 | N | Yes | 1 | WET |
| | Boron | 7440-42-8 | T | MG/KG | | U | | 0.68 | 0.68 | 2.3 | N | Yes | 1 | WET |
| | Cadmium | 7440-43-9 | T | MG/KG | | U | | 0.014 | 0.014 | 0.097 | N | Yes | 1 | WET |
| | Calcium | 7440-70-2 | T | MG/KG | 290 | | | 24.6 | 24.6 | 82.1 | Y | Yes | 1 | WET |
| | Chromium | 7440-47-3 | T | MG/KG | | UJ | L- | 0.086 | 0.086 | 0.29 | N | Yes | 1 | WET |
| | Cobalt | 7440-48-4 | T | MG/KG | | U | | 0.0080 | 0.0080 | 0.097 | N | Yes | 1 | WET |
| | Copper | 7440-50-8 | T | MG/KG | | U | | 0.28 | 0.28 | 0.92 | N | Yes | 1 | WET |
| | Lead | 7439-92-1 | T | MG/KG | | U | | 0.025 | 0.025 | 0.085 | N | Yes | 1 | WET |
| | Lithium | 7439-93-2 | T | MG/KG | | U | | 0.020 | 0.020 | 0.097 | N | Yes | 1 | WET |
| | Molybdenum | 7439-98-7 | T | MG/KG | | U | | 0.035 | 0.035 | 0.12 | N | Yes | 1 | WET |
| | Nickel | 7440-02-0 | T | MG/KG | 0.32 | | | 0.040 | 0.040 | 0.13 | Y | Yes | 1 | WET |
| | Selenium | 7782-49-2 | T | MG/KG | 0.38 | | | 0.049 | 0.049 | 0.16 | Y | Yes | 1 | WET |
| | Silver | 7440-22-4 | T | MG/KG | | U | | 0.011 | 0.011 | 0.049 | N | Yes | 1 | WET |
| | Strontium | 7440-24-6 | T | MG/KG | 0.19 | J | RL | 0.16 | 0.16 | 0.52 | Y | Yes | 1 | WET |
| | Thallium | 7440-28-0 | T | MG/KG | | U | | 0.013 | 0.013 | 0.097 | N | Yes | 1 | WET |
| | Vanadium | 7440-62-2 | T | MG/KG | | U | | 0.032 | 0.032 | 0.11 | N | Yes | 1 | WET |
| | Zinc | 7440-66-6 | T | MG/KG | 6.6 | | | 1.7 | 1.7 | 5.6 | Y | Yes | 1 | WET |
| SW-846 7473 | Mercury | 7439-97-6 | T | MG/KG | 0.084 | | | 0.0032 | 0.0032 | 0.020 | Y | Yes | 1 | WET |

**TVA TDEC Program**
**Facility: Cumberland Fossil Plant**
**SDG: 40182296**

| | |
|---|---|
| **Lab Sample ID** | 40182296017 |
| **Sys Sample Code** | CUF-FH-RS-CURA-F-20180501 |
| **Sample Name** | CUF-FH-RS-CURA-F-20180501 |
| **Sample Date** | 5/1/2018 10:30:00 AM |
| **Location** | CURA |
| **Sample Type** | N |
| **Parent Sample** | |

| Analytic Method | Chemical Name | CAS Rn | Fraction | Result Unit | Final Result | Final Qual | Reason code | Final MDL | Final RL | Final QL | Final Detect | Final Report | DF | Basis |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| ASTM D2974-87 | Percent Moisture | MOISTURE | N | % | 81.6 | | | 0.10 | 0.10 | 0.10 | Y | Yes | 1 | WET |
| SW-846 6020A | Antimony | 7440-36-0 | T | MG/KG | | U | | 0.015 | 0.015 | 0.092 | N | Yes | 1 | WET |
| | Arsenic | 7440-38-2 | T | MG/KG | | U* | BE | 0.061 | 0.061 | 0.093 | N | Yes | 1 | WET |
| | Barium | 7440-39-3 | T | MG/KG | | U | | 0.028 | 0.028 | 0.094 | N | Yes | 1 | WET |
| | Beryllium | 7440-41-7 | T | MG/KG | | U | | 0.031 | 0.031 | 0.10 | N | Yes | 1 | WET |
| | Boron | 7440-42-8 | T | MG/KG | | U | | 0.64 | 0.64 | 2.1 | N | Yes | 1 | WET |
| | Cadmium | 7440-43-9 | T | MG/KG | | U | | 0.013 | 0.013 | 0.092 | N | Yes | 1 | WET |
| | Calcium | 7440-70-2 | T | MG/KG | 270 | | | 23.4 | 23.4 | 78.1 | Y | Yes | 1 | WET |
| | Chromium | 7440-47-3 | T | MG/KG | | UJ | L- | 0.082 | 0.082 | 0.27 | N | Yes | 1 | WET |
| | Cobalt | 7440-48-4 | T | MG/KG | | U | | 0.0076 | 0.0076 | 0.092 | N | Yes | 1 | WET |
| | Copper | 7440-50-8 | T | MG/KG | | U | | 0.26 | 0.26 | 0.87 | N | Yes | 1 | WET |
| | Lead | 7439-92-1 | T | MG/KG | | U | | 0.024 | 0.024 | 0.081 | N | Yes | 1 | WET |
| | Lithium | 7439-93-2 | T | MG/KG | | U | | 0.019 | 0.019 | 0.092 | N | Yes | 1 | WET |
| | Molybdenum | 7439-98-7 | T | MG/KG | | U | | 0.033 | 0.033 | 0.11 | N | Yes | 1 | WET |
| | Nickel | 7440-02-0 | T | MG/KG | 0.043 | J | RL | 0.038 | 0.038 | 0.13 | Y | Yes | 1 | WET |
| | Selenium | 7782-49-2 | T | MG/KG | 0.55 | | | 0.047 | 0.047 | 0.16 | Y | Yes | 1 | WET |
| | Silver | 7440-22-4 | T | MG/KG | | U | | 0.010 | 0.010 | 0.046 | N | Yes | 1 | WET |
| | Strontium | 7440-24-6 | T | MG/KG | | U | | 0.15 | 0.15 | 0.49 | N | Yes | 1 | WET |
| | Thallium | 7440-28-0 | T | MG/KG | | U | | 0.012 | 0.012 | 0.092 | N | Yes | 1 | WET |
| | Vanadium | 7440-62-2 | T | MG/KG | | U | | 0.031 | 0.031 | 0.10 | N | Yes | 1 | WET |
| | Zinc | 7440-66-6 | T | MG/KG | 7.0 | | | 1.6 | 1.6 | 5.3 | Y | Yes | 1 | WET |
| SW-846 7473 | Mercury | 7439-97-6 | T | MG/KG | 0.14 | | | 0.0030 | 0.0030 | 0.019 | Y | Yes | 1 | WET |

**TVA TDEC Program**
**Facility: Cumberland Fossil Plant**
**SDG: 40182296**

| | |
|---|---|
| **Lab Sample ID** | 40182296018 |
| **Sys Sample Code** | CUF-FH-RS-CURU-F-20180502 |
| **Sample Name** | CUF-FH-RS-CURU-F-20180502 |
| **Sample Date** | 5/2/2018 1:00:00 PM |
| **Location** | CURU |
| **Sample Type** | N |
| **Parent Sample** | |

| Analytic Method | Chemical Name | CAS Rn | Fraction | Result Unit | Final Result | Final Qual | Reason code | Final MDL | Final RL | Final QL | Final Detect | Final Report | DF | Basis |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| ASTM D2974-87 | Percent Moisture | MOISTURE | N | % | 81.7 | | | 0.10 | 0.10 | 0.10 | Y | Yes | 1 | WET |
| SW-846 6020A | Antimony | 7440-36-0 | T | MG/KG | | U | | 0.016 | 0.016 | 0.099 | N | Yes | 1 | WET |
| | Arsenic | 7440-38-2 | T | MG/KG | | U* | BE | 0.054 | 0.054 | 0.10 | N | Yes | 1 | WET |
| | Barium | 7440-39-3 | T | MG/KG | | U | | 0.030 | 0.030 | 0.10 | N | Yes | 1 | WET |
| | Beryllium | 7440-41-7 | T | MG/KG | | U | | 0.033 | 0.033 | 0.11 | N | Yes | 1 | WET |
| | Boron | 7440-42-8 | T | MG/KG | | U | | 0.69 | 0.69 | 2.3 | N | Yes | 1 | WET |
| | Cadmium | 7440-43-9 | T | MG/KG | | U | | 0.014 | 0.014 | 0.099 | N | Yes | 1 | WET |
| | Calcium | 7440-70-2 | T | MG/KG | 135 | | | 25.2 | 25.2 | 84.0 | Y | Yes | 1 | WET |
| | Chromium | 7440-47-3 | T | MG/KG | | UJ | L- | 0.088 | 0.088 | 0.29 | N | Yes | 1 | WET |
| | Cobalt | 7440-48-4 | T | MG/KG | | U | | 0.0081 | 0.0081 | 0.099 | N | Yes | 1 | WET |
| | Copper | 7440-50-8 | T | MG/KG | | U* | BE | 0.39 | 0.39 | 0.94 | N | Yes | 1 | WET |
| | Lead | 7439-92-1 | T | MG/KG | | U | | 0.026 | 0.026 | 0.087 | N | Yes | 1 | WET |
| | Lithium | 7439-93-2 | T | MG/KG | | U | | 0.021 | 0.021 | 0.099 | N | Yes | 1 | WET |
| | Molybdenum | 7439-98-7 | T | MG/KG | | U | | 0.036 | 0.036 | 0.12 | N | Yes | 1 | WET |
| | Nickel | 7440-02-0 | T | MG/KG | 0.061 | J | RL | 0.041 | 0.041 | 0.14 | Y | Yes | 1 | WET |
| | Selenium | 7782-49-2 | T | MG/KG | 0.49 | | | 0.050 | 0.050 | 0.17 | Y | Yes | 1 | WET |
| | Silver | 7440-22-4 | T | MG/KG | | U | | 0.011 | 0.011 | 0.050 | N | Yes | 1 | WET |
| | Strontium | 7440-24-6 | T | MG/KG | | U | | 0.16 | 0.16 | 0.53 | N | Yes | 1 | WET |
| | Thallium | 7440-28-0 | T | MG/KG | | U | | 0.013 | 0.013 | 0.099 | N | Yes | 1 | WET |
| | Vanadium | 7440-62-2 | T | MG/KG | | U | | 0.033 | 0.033 | 0.11 | N | Yes | 1 | WET |
| | Zinc | 7440-66-6 | T | MG/KG | 6.8 | | | 1.7 | 1.7 | 5.7 | Y | Yes | 1 | WET |
| SW-846 7473 | Mercury | 7439-97-6 | T | MG/KG | 0.11 | | | 0.0031 | 0.0031 | 0.020 | Y | Yes | 1 | WET |

**TVA TDEC Program**
**Facility: Cumberland Fossil Plant**
**SDG: 40182296**

| | |
|---|---|
| **Lab Sample ID** | 40182296019 |
| **Sys Sample Code** | CUF-FH-RS-WCD-F-20180510 |
| **Sample Name** | CUF-FH-RS-WCD-F-20180510 |
| **Sample Date** | 5/10/2018 10:18:00 AM |
| **Location** | WCD |
| **Sample Type** | N |
| **Parent Sample** | |

| Analytic Method | Chemical Name | CAS Rn | Fraction | Result Unit | Final Result | Final Qual | Reason code | Final MDL | Final RL | Final QL | Final Detect | Final Report | DF | Basis |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| ASTM D2974-87 | Percent Moisture | MOISTURE | N | % | 82.3 | | | 0.10 | 0.10 | 0.10 | Y | Yes | 1 | WET |
| SW-846 6020A | Antimony | 7440-36-0 | T | MG/KG | | U | | 0.016 | 0.016 | 0.10 | N | Yes | 1 | WET |
| | Arsenic | 7440-38-2 | T | MG/KG | | U* | BE | 0.075 | 0.075 | 0.10 | N | Yes | 1 | WET |
| | Barium | 7440-39-3 | T | MG/KG | | U* | BE | 0.14 | 0.14 | 0.14 | N | Yes | 1 | WET |
| | Beryllium | 7440-41-7 | T | MG/KG | | U | | 0.033 | 0.033 | 0.11 | N | Yes | 1 | WET |
| | Boron | 7440-42-8 | T | MG/KG | | U | | 0.69 | 0.69 | 2.3 | N | Yes | 1 | WET |
| | Cadmium | 7440-43-9 | T | MG/KG | | U | | 0.014 | 0.014 | 0.10 | N | Yes | 1 | WET |
| | Calcium | 7440-70-2 | T | MG/KG | 1350 | | | 25.3 | 25.3 | 84.3 | Y | Yes | 1 | WET |
| | Chromium | 7440-47-3 | T | MG/KG | | UJ | L- | 0.088 | 0.088 | 0.29 | N | Yes | 1 | WET |
| | Cobalt | 7440-48-4 | T | MG/KG | | U | | 0.0082 | 0.0082 | 0.10 | N | Yes | 1 | WET |
| | Copper | 7440-50-8 | T | MG/KG | | U | | 0.28 | 0.28 | 0.94 | N | Yes | 1 | WET |
| | Lead | 7439-92-1 | T | MG/KG | | U | | 0.026 | 0.026 | 0.087 | N | Yes | 1 | WET |
| | Lithium | 7439-93-2 | T | MG/KG | | U | | 0.021 | 0.021 | 0.10 | N | Yes | 1 | WET |
| | Molybdenum | 7439-98-7 | T | MG/KG | | U | | 0.036 | 0.036 | 0.12 | N | Yes | 1 | WET |
| | Nickel | 7440-02-0 | T | MG/KG | | U | | 0.041 | 0.041 | 0.14 | N | Yes | 1 | WET |
| | Selenium | 7782-49-2 | T | MG/KG | 0.69 | | | 0.050 | 0.050 | 0.17 | Y | Yes | 1 | WET |
| | Silver | 7440-22-4 | T | MG/KG | | U | | 0.011 | 0.011 | 0.050 | N | Yes | 1 | WET |
| | Strontium | 7440-24-6 | T | MG/KG | 0.91 | | | 0.16 | 0.16 | 0.53 | Y | Yes | 1 | WET |
| | Thallium | 7440-28-0 | T | MG/KG | | U | | 0.013 | 0.013 | 0.10 | N | Yes | 1 | WET |
| | Vanadium | 7440-62-2 | T | MG/KG | | U | | 0.033 | 0.033 | 0.11 | N | Yes | 1 | WET |
| | Zinc | 7440-66-6 | T | MG/KG | 8.0 | | | 1.7 | 1.7 | 5.7 | Y | Yes | 1 | WET |
| SW-846 7473 | Mercury | 7439-97-6 | T | MG/KG | 0.12 | | | 0.0030 | 0.0030 | 0.019 | Y | Yes | 1 | WET |

**TVA TDEC Program**
**Facility: Cumberland Fossil Plant**
**SDG: 40182296**

| | |
|---|---|
| **Lab Sample ID** | 40182296020 |
| **Sys Sample Code** | CUF-FH-RS-WCU-F-20180501 |
| **Sample Name** | CUF-FH-RS-WCU-F-20180501 |
| **Sample Date** | 5/1/2018 4:40:00 PM |
| **Location** | WCU |
| **Sample Type** | N |
| **Parent Sample** | |

| Analytic Method | Chemical Name | CAS Rn | Fraction | Result Unit | Final Result | Final Qual | Reason code | Final MDL | Final RL | Final QL | Final Detect | Final Report | DF | Basis |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| ASTM D2974-87 | Percent Moisture | MOISTURE | N | % | 81.9 | | | 0.10 | 0.10 | 0.10 | Y | Yes | 1 | WET |
| SW-846 6020A | Antimony | 7440-36-0 | T | MG/KG | | U | | 0.016 | 0.016 | 0.098 | N | Yes | 1 | WET |
| | Arsenic | 7440-38-2 | T | MG/KG | | U* | BE | 0.056 | 0.056 | 0.098 | N | Yes | 1 | WET |
| | Barium | 7440-39-3 | T | MG/KG | | U* | BE | 0.045 | 0.045 | 0.10 | N | Yes | 1 | WET |
| | Beryllium | 7440-41-7 | T | MG/KG | | U | | 0.032 | 0.032 | 0.11 | N | Yes | 1 | WET |
| | Boron | 7440-42-8 | T | MG/KG | | U | | 0.68 | 0.68 | 2.3 | N | Yes | 1 | WET |
| | Cadmium | 7440-43-9 | T | MG/KG | | U | | 0.014 | 0.014 | 0.098 | N | Yes | 1 | WET |
| | Calcium | 7440-70-2 | T | MG/KG | 461 | | | 24.8 | 24.8 | 82.8 | Y | Yes | 1 | WET |
| | Chromium | 7440-47-3 | T | MG/KG | | UJ | L- | 0.087 | 0.087 | 0.29 | N | Yes | 1 | WET |
| | Cobalt | 7440-48-4 | T | MG/KG | | U | | 0.0080 | 0.0080 | 0.098 | N | Yes | 1 | WET |
| | Copper | 7440-50-8 | T | MG/KG | | U | | 0.28 | 0.28 | 0.93 | N | Yes | 1 | WET |
| | Lead | 7439-92-1 | T | MG/KG | | U | | 0.026 | 0.026 | 0.085 | N | Yes | 1 | WET |
| | Lithium | 7439-93-2 | T | MG/KG | | U | | 0.021 | 0.021 | 0.098 | N | Yes | 1 | WET |
| | Molybdenum | 7439-98-7 | T | MG/KG | | U | | 0.035 | 0.035 | 0.12 | N | Yes | 1 | WET |
| | Nickel | 7440-02-0 | T | MG/KG | 0.041 | J | RL | 0.040 | 0.040 | 0.13 | Y | Yes | 1 | WET |
| | Selenium | 7782-49-2 | T | MG/KG | 0.56 | | | 0.050 | 0.050 | 0.17 | Y | Yes | 1 | WET |
| | Silver | 7440-22-4 | T | MG/KG | | U | | 0.011 | 0.011 | 0.049 | N | Yes | 1 | WET |
| | Strontium | 7440-24-6 | T | MG/KG | 0.32 | J | RL | 0.16 | 0.16 | 0.52 | Y | Yes | 1 | WET |
| | Thallium | 7440-28-0 | T | MG/KG | | U | | 0.013 | 0.013 | 0.098 | N | Yes | 1 | WET |
| | Vanadium | 7440-62-2 | T | MG/KG | | U | | 0.033 | 0.033 | 0.11 | N | Yes | 1 | WET |
| | Zinc | 7440-66-6 | T | MG/KG | 6.4 | | | 1.7 | 1.7 | 5.6 | Y | Yes | 1 | WET |
| SW-846 7473 | Mercury | 7439-97-6 | T | MG/KG | 0.16 | J | C | 0.0031 | 0.0031 | 0.020 | Y | Yes | 1 | WET |

## B. WORK ORDER 40182297

**TVA TDEC Program**
**Facility: Cumberland Fossil Plant**
**SDG: 40182297**

| | |
|---|---|
| **Lab Sample ID** | 40182297001 |
| **Sys Sample Code** | CUF-FH-BG-CURD-O-20180509 |
| **Sample Name** | CUF-FH-BG-CURD-O-20180509 |
| **Sample Date** | 5/9/2018 5:50:00 PM |
| **Location** | CURD |
| **Sample Type** | N |
| **Parent Sample** | |

| Analytic Method | Chemical Name | CAS Rn | Fraction | Result Unit | Final Result | Final Qual | Reason code | Final MDL | Final RL | Final QL | Final Detect | Final Report | DF | Basis |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| ASTM D2974-87 | Percent Moisture | MOISTURE | N | % | 68.1 | | | 0.10 | 0.10 | 0.10 | Y | Yes | 1 | WET |
| SW-846 6020A | Antimony | 7440-36-0 | T | MG/KG | | U* | BL | 0.034 | 0.034 | 0.19 | N | Yes | 2 | WET |
| | Arsenic | 7440-38-2 | T | MG/KG | | U* | BL,BE | 0.081 | 0.081 | 0.19 | N | Yes | 2 | WET |
| | Barium | 7440-39-3 | T | MG/KG | | U* | BE | 0.15 | 0.15 | 0.20 | N | Yes | 2 | WET |
| | Beryllium | 7440-41-7 | T | MG/KG | | U | | 0.064 | 0.064 | 0.21 | N | Yes | 2 | WET |
| | Boron | 7440-42-8 | T | MG/KG | | U | | 1.3 | 1.3 | 4.5 | N | Yes | 2 | WET |
| | Cadmium | 7440-43-9 | T | MG/KG | | U* | BE,BL | 0.049 | 0.049 | 0.19 | N | Yes | 2 | WET |
| | Calcium | 7440-70-2 | T | MG/KG | 211 | | | 48.9 | 48.9 | 163 | Y | Yes | 2 | WET |
| | Chromium | 7440-47-3 | T | MG/KG | | U | | 0.17 | 0.17 | 0.57 | N | Yes | 2 | WET |
| | Cobalt | 7440-48-4 | T | MG/KG | | U* | BL | 0.072 | 0.072 | 0.19 | N | Yes | 2 | WET |
| | Copper | 7440-50-8 | T | MG/KG | | U* | BE | 1.1 | 1.1 | 1.8 | N | Yes | 2 | WET |
| | Lead | 7439-92-1 | T | MG/KG | | U | | 0.025 | 0.025 | 0.084 | N | Yes | 1 | WET |
| | Lithium | 7439-93-2 | T | MG/KG | | U | | 0.040 | 0.040 | 0.19 | N | Yes | 2 | WET |
| | Molybdenum | 7439-98-7 | T | MG/KG | | U* | BL | 0.084 | 0.084 | 0.23 | N | Yes | 2 | WET |
| | Nickel | 7440-02-0 | T | MG/KG | | U | | 0.079 | 0.079 | 0.26 | N | Yes | 2 | WET |
| | Selenium | 7782-49-2 | T | MG/KG | 0.79 | | | 0.098 | 0.098 | 0.33 | Y | Yes | 2 | WET |
| | Silver | 7440-22-4 | T | MG/KG | | U* | BL | 0.023 | 0.023 | 0.096 | N | Yes | 2 | WET |
| | Strontium | 7440-24-6 | T | MG/KG | 0.35 | J | RL | 0.31 | 0.31 | 1.0 | Y | Yes | 2 | WET |
| | Thallium | 7440-28-0 | T | MG/KG | | U | | 0.013 | 0.013 | 0.096 | N | Yes | 1 | WET |
| | Vanadium | 7440-62-2 | T | MG/KG | | U | | 0.064 | 0.064 | 0.21 | N | Yes | 2 | WET |
| | Zinc | 7440-66-6 | T | MG/KG | 28.2 | | | 3.3 | 3.3 | 11.1 | Y | Yes | 2 | WET |
| SW-846 7473 | Mercury | 7439-97-6 | T | MG/KG | | U | | 0.0032 | 0.0032 | 0.020 | N | Yes | 1 | WET |

**TVA TDEC Program**
**Facility: Cumberland Fossil Plant**
**SDG: 40182297**

| | |
|---|---|
| **Lab Sample ID** | 40182297002 |
| **Sys Sample Code** | CUF-FH-BG-CURA-O-20180509 |
| **Sample Name** | CUF-FH-BG-CURA-O-20180509 |
| **Sample Date** | 5/9/2018 2:17:00 PM |
| **Location** | CURA |
| **Sample Type** | N |
| **Parent Sample** | |

| Analytic Method | Chemical Name | CAS Rn | Fraction | Result Unit | Final Result | Final Qual | Reason code | Final MDL | Final RL | Final QL | Final Detect | Final Report | DF | Basis |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| ASTM D2974-87 | Percent Moisture | MOISTURE | N | % | 66.1 | | | 0.10 | 0.10 | 0.10 | Y | Yes | 1 | WET |
| SW-846 6020A | Antimony | 7440-36-0 | T | MG/KG | | U | | 0.030 | 0.030 | 0.19 | N | Yes | 2 | WET |
| | Arsenic | 7440-38-2 | T | MG/KG | | U | | 0.056 | 0.056 | 0.19 | N | Yes | 2 | WET |
| | Barium | 7440-39-3 | T | MG/KG | | U* | BE | 0.20 | 0.20 | 0.20 | N | Yes | 2 | WET |
| | Beryllium | 7440-41-7 | T | MG/KG | | U | | 0.062 | 0.062 | 0.21 | N | Yes | 2 | WET |
| | Boron | 7440-42-8 | T | MG/KG | | U | | 1.3 | 1.3 | 4.3 | N | Yes | 2 | WET |
| | Cadmium | 7440-43-9 | T | MG/KG | | U | | 0.026 | 0.026 | 0.19 | N | Yes | 2 | WET |
| | Calcium | 7440-70-2 | T | MG/KG | 153 | J | RL | 47.5 | 47.5 | 158 | Y | Yes | 2 | WET |
| | Chromium | 7440-47-3 | T | MG/KG | | U | | 0.17 | 0.17 | 0.55 | N | Yes | 2 | WET |
| | Cobalt | 7440-48-4 | T | MG/KG | | U* | BL | 0.036 | 0.036 | 0.19 | N | Yes | 2 | WET |
| | Copper | 7440-50-8 | T | MG/KG | | U* | BE | 1.1 | 1.1 | 1.8 | N | Yes | 2 | WET |
| | Lead | 7439-92-1 | T | MG/KG | | U | | 0.024 | 0.024 | 0.082 | N | Yes | 1 | WET |
| | Lithium | 7439-93-2 | T | MG/KG | | U | | 0.039 | 0.039 | 0.19 | N | Yes | 2 | WET |
| | Molybdenum | 7439-98-7 | T | MG/KG | | U | | 0.067 | 0.067 | 0.22 | N | Yes | 2 | WET |
| | Nickel | 7440-02-0 | T | MG/KG | | U | | 0.077 | 0.077 | 0.26 | N | Yes | 2 | WET |
| | Selenium | 7782-49-2 | T | MG/KG | 1.1 | | | 0.095 | 0.095 | 0.32 | Y | Yes | 2 | WET |
| | Silver | 7440-22-4 | T | MG/KG | | U | | 0.021 | 0.021 | 0.094 | N | Yes | 2 | WET |
| | Strontium | 7440-24-6 | T | MG/KG | | U | | 0.30 | 0.30 | 1.0 | N | Yes | 2 | WET |
| | Thallium | 7440-28-0 | T | MG/KG | | U | | 0.012 | 0.012 | 0.094 | N | Yes | 1 | WET |
| | Vanadium | 7440-62-2 | T | MG/KG | | U | | 0.062 | 0.062 | 0.21 | N | Yes | 2 | WET |
| | Zinc | 7440-66-6 | T | MG/KG | 30.5 | | | 3.2 | 3.2 | 10.8 | Y | Yes | 2 | WET |
| SW-846 7473 | Mercury | 7439-97-6 | T | MG/KG | | U* | BL | 0.0050 | 0.0050 | 0.018 | N | Yes | 1 | WET |

**TVA TDEC Program**
**Facility: Cumberland Fossil Plant**
**SDG: 40182297**

| | |
|---|---|
| **Lab Sample ID** | 40182297003 |
| **Sys Sample Code** | CUF-FH-BG-CURU-O-20180509 |
| **Sample Name** | CUF-FH-BG-CURU-O-20180509 |
| **Sample Date** | 5/9/2018 11:20:00 AM |
| **Location** | CURU |
| **Sample Type** | N |
| **Parent Sample** | |

| Analytic Method | Chemical Name | CAS Rn | Fraction | Result Unit | Final Result | Final Qual | Reason code | Final MDL | Final RL | Final QL | Final Detect | Final Report | DF | Basis |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| ASTM D2974-87 | Percent Moisture | MOISTURE | N | % | 67.8 | | | 0.10 | 0.10 | 0.10 | Y | Yes | 1 | WET |
| SW-846 6020A | Antimony | 7440-36-0 | T | MG/KG | | U | | 0.032 | 0.032 | 0.20 | N | Yes | 2 | WET |
| | Arsenic | 7440-38-2 | T | MG/KG | | U* | BL,BE | 0.065 | 0.065 | 0.20 | N | Yes | 2 | WET |
| | Barium | 7440-39-3 | T | MG/KG | | U* | BE | 0.13 | 0.13 | 0.20 | N | Yes | 2 | WET |
| | Beryllium | 7440-41-7 | T | MG/KG | | U | | 0.066 | 0.066 | 0.22 | N | Yes | 2 | WET |
| | Boron | 7440-42-8 | T | MG/KG | | U | | 1.4 | 1.4 | 4.6 | N | Yes | 2 | WET |
| | Cadmium | 7440-43-9 | T | MG/KG | | U | | 0.028 | 0.028 | 0.20 | N | Yes | 2 | WET |
| | Calcium | 7440-70-2 | T | MG/KG | 171 | | | 50.5 | 50.5 | 168 | Y | Yes | 2 | WET |
| | Chromium | 7440-47-3 | T | MG/KG | | U | | 0.18 | 0.18 | 0.59 | N | Yes | 2 | WET |
| | Cobalt | 7440-48-4 | T | MG/KG | | U* | BL | 0.038 | 0.038 | 0.20 | N | Yes | 2 | WET |
| | Copper | 7440-50-8 | T | MG/KG | | U* | BE | 1.2 | 1.2 | 1.9 | N | Yes | 2 | WET |
| | Lead | 7439-92-1 | T | MG/KG | | U | | 0.026 | 0.026 | 0.087 | N | Yes | 1 | WET |
| | Lithium | 7439-93-2 | T | MG/KG | | U | | 0.042 | 0.042 | 0.20 | N | Yes | 2 | WET |
| | Molybdenum | 7439-98-7 | T | MG/KG | | U | | 0.071 | 0.071 | 0.24 | N | Yes | 2 | WET |
| | Nickel | 7440-02-0 | T | MG/KG | | U | | 0.082 | 0.082 | 0.27 | N | Yes | 2 | WET |
| | Selenium | 7782-49-2 | T | MG/KG | 0.87 | | | 0.10 | 0.10 | 0.34 | Y | Yes | 2 | WET |
| | Silver | 7440-22-4 | T | MG/KG | | U | | 0.022 | 0.022 | 0.099 | N | Yes | 2 | WET |
| | Strontium | 7440-24-6 | T | MG/KG | | U | | 0.32 | 0.32 | 1.1 | N | Yes | 2 | WET |
| | Thallium | 7440-28-0 | T | MG/KG | | U | | 0.013 | 0.013 | 0.099 | N | Yes | 1 | WET |
| | Vanadium | 7440-62-2 | T | MG/KG | | U | | 0.066 | 0.066 | 0.22 | N | Yes | 2 | WET |
| | Zinc | 7440-66-6 | T | MG/KG | 30.5 | | | 3.4 | 3.4 | 11.4 | Y | Yes | 2 | WET |
| SW-846 7473 | Mercury | 7439-97-6 | T | MG/KG | | U* | BL | 0.0043 | 0.0043 | 0.020 | N | Yes | 1 | WET |

**TVA TDEC Program**
**Facility: Cumberland Fossil Plant**
**SDG: 40182297**

| | |
|---|---|
| **Lab Sample ID** | 40182297004 |
| **Sys Sample Code** | CUF-FH-BG-WCD-O-20180510 |
| **Sample Name** | CUF-FH-BG-WCD-O-20180510 |
| **Sample Date** | 5/10/2018 10:18:00 AM |
| **Location** | WCD |
| **Sample Type** | N |
| **Parent Sample** | |

| Analytic Method | Chemical Name | CAS Rn | Fraction | Result Unit | Final Result | Final Qual | Reason code | Final MDL | Final RL | Final QL | Final Detect | Final Report | DF | Basis |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| ASTM D2974-87 | Percent Moisture | MOISTURE | N | % | 68.5 | | | 0.10 | 0.10 | 0.10 | Y | Yes | 1 | WET |
| SW-846 6020A | Antimony | 7440-36-0 | T | MG/KG | | U | | 0.030 | 0.030 | 0.19 | N | Yes | 2 | WET |
| | Arsenic | 7440-38-2 | T | MG/KG | | U | | 0.056 | 0.056 | 0.19 | N | Yes | 2 | WET |
| | Barium | 7440-39-3 | T | MG/KG | | U* | BE | 0.18 | 0.18 | 0.19 | N | Yes | 2 | WET |
| | Beryllium | 7440-41-7 | T | MG/KG | | U | | 0.062 | 0.062 | 0.21 | N | Yes | 2 | WET |
| | Boron | 7440-42-8 | T | MG/KG | | U | | 1.3 | 1.3 | 4.3 | N | Yes | 2 | WET |
| | Cadmium | 7440-43-9 | T | MG/KG | | U | | 0.026 | 0.026 | 0.19 | N | Yes | 2 | WET |
| | Calcium | 7440-70-2 | T | MG/KG | 219 | | | 47.2 | 47.2 | 157 | Y | Yes | 2 | WET |
| | Chromium | 7440-47-3 | T | MG/KG | | U | | 0.16 | 0.16 | 0.55 | N | Yes | 2 | WET |
| | Cobalt | 7440-48-4 | T | MG/KG | | U* | BL | 0.036 | 0.036 | 0.19 | N | Yes | 2 | WET |
| | Copper | 7440-50-8 | T | MG/KG | | U* | BE | 0.99 | 0.99 | 1.8 | N | Yes | 2 | WET |
| | Lead | 7439-92-1 | T | MG/KG | | U | | 0.024 | 0.024 | 0.081 | N | Yes | 1 | WET |
| | Lithium | 7439-93-2 | T | MG/KG | | U | | 0.039 | 0.039 | 0.19 | N | Yes | 2 | WET |
| | Molybdenum | 7439-98-7 | T | MG/KG | | U | | 0.067 | 0.067 | 0.22 | N | Yes | 2 | WET |
| | Nickel | 7440-02-0 | T | MG/KG | | U | | 0.076 | 0.076 | 0.25 | N | Yes | 2 | WET |
| | Selenium | 7782-49-2 | T | MG/KG | 0.72 | | | 0.094 | 0.094 | 0.31 | Y | Yes | 2 | WET |
| | Silver | 7440-22-4 | T | MG/KG | | U | | 0.021 | 0.021 | 0.093 | N | Yes | 2 | WET |
| | Strontium | 7440-24-6 | T | MG/KG | 0.33 | J | RL | 0.30 | 0.30 | 1.0 | Y | Yes | 2 | WET |
| | Thallium | 7440-28-0 | T | MG/KG | | U | | 0.012 | 0.012 | 0.093 | N | Yes | 1 | WET |
| | Vanadium | 7440-62-2 | T | MG/KG | | U | | 0.062 | 0.062 | 0.21 | N | Yes | 2 | WET |
| | Zinc | 7440-66-6 | T | MG/KG | 28.8 | | | 3.2 | 3.2 | 10.7 | Y | Yes | 2 | WET |
| SW-846 7473 | Mercury | 7439-97-6 | T | MG/KG | | U* | BL | 0.0038 | 0.0038 | 0.019 | N | Yes | 1 | WET |

**TVA TDEC Program**
**Facility: Cumberland Fossil Plant**
**SDG: 40182297**

| | |
|---|---|
| **Lab Sample ID** | 40182297005 |
| **Sys Sample Code** | CUF-FH-BG-WCU-O-20180508 |
| **Sample Name** | CUF-FH-BG-WCU-O-20180508 |
| **Sample Date** | 5/8/2018 6:08:00 PM |
| **Location** | WCU |
| **Sample Type** | N |
| **Parent Sample** | |

| Analytic Method | Chemical Name | CAS Rn | Fraction | Result Unit | Final Result | Final Qual | Reason code | Final MDL | Final RL | Final QL | Final Detect | Final Report | DF | Basis |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| ASTM D2974-87 | Percent Moisture | MOISTURE | N | % | 66.0 | | | 0.10 | 0.10 | 0.10 | Y | Yes | 1 | WET |
| SW-846 6020A | Antimony | 7440-36-0 | T | MG/KG | | U | | 0.031 | 0.031 | 0.19 | N | Yes | 2 | WET |
| | Arsenic | 7440-38-2 | T | MG/KG | | U | | 0.058 | 0.058 | 0.19 | N | Yes | 2 | WET |
| | Barium | 7440-39-3 | T | MG/KG | | U* | BE | 0.32 | 0.32 | 0.32 | N | Yes | 2 | WET |
| | Beryllium | 7440-41-7 | T | MG/KG | | U | | 0.064 | 0.064 | 0.21 | N | Yes | 2 | WET |
| | Boron | 7440-42-8 | T | MG/KG | | U | | 1.3 | 1.3 | 4.5 | N | Yes | 2 | WET |
| | Cadmium | 7440-43-9 | T | MG/KG | | U | | 0.027 | 0.027 | 0.19 | N | Yes | 2 | WET |
| | Calcium | 7440-70-2 | T | MG/KG | 143 | J | RL | 49.0 | 49.0 | 163 | Y | Yes | 2 | WET |
| | Chromium | 7440-47-3 | T | MG/KG | | U | | 0.17 | 0.17 | 0.57 | N | Yes | 2 | WET |
| | Cobalt | 7440-48-4 | T | MG/KG | | U* | BL | 0.046 | 0.046 | 0.19 | N | Yes | 2 | WET |
| | Copper | 7440-50-8 | T | MG/KG | | U* | BE | 1.1 | 1.1 | 1.8 | N | Yes | 2 | WET |
| | Lead | 7439-92-1 | T | MG/KG | | U | | 0.025 | 0.025 | 0.084 | N | Yes | 1 | WET |
| | Lithium | 7439-93-2 | T | MG/KG | | U | | 0.041 | 0.041 | 0.19 | N | Yes | 2 | WET |
| | Molybdenum | 7439-98-7 | T | MG/KG | | U* | BL | 0.10 | 0.10 | 0.23 | N | Yes | 2 | WET |
| | Nickel | 7440-02-0 | T | MG/KG | | U | | 0.079 | 0.079 | 0.26 | N | Yes | 2 | WET |
| | Selenium | 7782-49-2 | T | MG/KG | 1.0 | | | 0.098 | 0.098 | 0.33 | Y | Yes | 2 | WET |
| | Silver | 7440-22-4 | T | MG/KG | | U | | 0.022 | 0.022 | 0.096 | N | Yes | 2 | WET |
| | Strontium | 7440-24-6 | T | MG/KG | | U | | 0.31 | 0.31 | 1.0 | N | Yes | 2 | WET |
| | Thallium | 7440-28-0 | T | MG/KG | | U | | 0.013 | 0.013 | 0.096 | N | Yes | 1 | WET |
| | Vanadium | 7440-62-2 | T | MG/KG | | U | | 0.064 | 0.064 | 0.21 | N | Yes | 2 | WET |
| | Zinc | 7440-66-6 | T | MG/KG | 30.7 | | | 3.3 | 3.3 | 11.1 | Y | Yes | 2 | WET |
| SW-846 7473 | Mercury | 7439-97-6 | T | MG/KG | | U | | 0.0030 | 0.0030 | 0.019 | N | Yes | 1 | WET |

**TVA TDEC Program**
**Facility: Cumberland Fossil Plant**
**SDG: 40182297**

| | |
|---|---|
| **Lab Sample ID** | 40182297006 |
| **Sys Sample Code** | CUF-FH-CC-CURD-O-20180509 |
| **Sample Name** | CUF-FH-CC-CURD-O-20180509 |
| **Sample Date** | 5/9/2018 5:50:00 PM |
| **Location** | CURD |
| **Sample Type** | N |
| **Parent Sample** | |

| Analytic Method | Chemical Name | CAS Rn | Fraction | Result Unit | Final Result | Final Qual | Reason code | Final MDL | Final RL | Final QL | Final Detect | Final Report | DF | Basis |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| ASTM D2974-87 | Percent Moisture | MOISTURE | N | % | 59.3 | | | 0.10 | 0.10 | 0.10 | Y | Yes | 1 | WET |
| SW-846 6020A | Antimony | 7440-36-0 | T | MG/KG | | U | | 0.032 | 0.032 | 0.20 | N | Yes | 2 | WET |
| | Arsenic | 7440-38-2 | T | MG/KG | | U | | 0.060 | 0.060 | 0.20 | N | Yes | 2 | WET |
| | Barium | 7440-39-3 | T | MG/KG | | U* | BE | 0.17 | 0.17 | 0.20 | N | Yes | 2 | WET |
| | Beryllium | 7440-41-7 | T | MG/KG | | U | | 0.066 | 0.066 | 0.22 | N | Yes | 2 | WET |
| | Boron | 7440-42-8 | T | MG/KG | | U | | 1.4 | 1.4 | 4.6 | N | Yes | 2 | WET |
| | Cadmium | 7440-43-9 | T | MG/KG | | U | | 0.028 | 0.028 | 0.20 | N | Yes | 2 | WET |
| | Calcium | 7440-70-2 | T | MG/KG | 892 | | | 50.4 | 50.4 | 168 | Y | Yes | 2 | WET |
| | Chromium | 7440-47-3 | T | MG/KG | | U | | 0.18 | 0.18 | 0.59 | N | Yes | 2 | WET |
| | Cobalt | 7440-48-4 | T | MG/KG | | U* | BL | 0.034 | 0.034 | 0.20 | N | Yes | 2 | WET |
| | Copper | 7440-50-8 | T | MG/KG | | U* | BE | 1.4 | 1.4 | 1.9 | N | Yes | 2 | WET |
| | Lead | 7439-92-1 | T | MG/KG | | U | | 0.026 | 0.026 | 0.087 | N | Yes | 1 | WET |
| | Lithium | 7439-93-2 | T | MG/KG | | U | | 0.042 | 0.042 | 0.20 | N | Yes | 2 | WET |
| | Molybdenum | 7439-98-7 | T | MG/KG | | U | | 0.071 | 0.071 | 0.24 | N | Yes | 2 | WET |
| | Nickel | 7440-02-0 | T | MG/KG | | U | | 0.082 | 0.082 | 0.27 | N | Yes | 2 | WET |
| | Selenium | 7782-49-2 | T | MG/KG | 1.2 | | | 0.10 | 0.10 | 0.34 | Y | Yes | 2 | WET |
| | Silver | 7440-22-4 | T | MG/KG | | U | | 0.022 | 0.022 | 0.099 | N | Yes | 2 | WET |
| | Strontium | 7440-24-6 | T | MG/KG | 1.2 | | | 0.32 | 0.32 | 1.1 | Y | Yes | 2 | WET |
| | Thallium | 7440-28-0 | T | MG/KG | | U | | 0.013 | 0.013 | 0.099 | N | Yes | 1 | WET |
| | Vanadium | 7440-62-2 | T | MG/KG | | U | | 0.066 | 0.066 | 0.22 | N | Yes | 2 | WET |
| | Zinc | 7440-66-6 | T | MG/KG | 40.6 | | | 3.4 | 3.4 | 11.4 | Y | Yes | 2 | WET |
| SW-846 7473 | Mercury | 7439-97-6 | T | MG/KG | | U | | 0.0032 | 0.0032 | 0.020 | N | Yes | 1 | WET |

**TVA TDEC Program**
**Facility: Cumberland Fossil Plant**
**SDG: 40182297**

| | |
|---|---|
| **Lab Sample ID** | 40182297007 |
| **Sys Sample Code** | CUF-FH-CC-CURA-O-20180509 |
| **Sample Name** | CUF-FH-CC-CURA-O-20180509 |
| **Sample Date** | 5/9/2018 2:17:00 PM |
| **Location** | CURA |
| **Sample Type** | N |
| **Parent Sample** | |

| Analytic Method | Chemical Name | CAS Rn | Fraction | Result Unit | Final Result | Final Qual | Reason code | Final MDL | Final RL | Final QL | Final Detect | Final Report | DF | Basis |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| ASTM D2974-87 | Percent Moisture | MOISTURE | N | % | 57.9 | | | 0.10 | 0.10 | 0.10 | Y | Yes | 1 | WET |
| SW-846 6020A | Antimony | 7440-36-0 | T | MG/KG | | U | | 0.033 | 0.033 | 0.20 | N | Yes | 2 | WET |
| | Arsenic | 7440-38-2 | T | MG/KG | | U | | 0.060 | 0.060 | 0.20 | N | Yes | 2 | WET |
| | Barium | 7440-39-3 | T | MG/KG | | U* | BE | 0.18 | 0.18 | 0.20 | N | Yes | 2 | WET |
| | Beryllium | 7440-41-7 | T | MG/KG | | U | | 0.066 | 0.066 | 0.22 | N | Yes | 2 | WET |
| | Boron | 7440-42-8 | T | MG/KG | | U | | 1.4 | 1.4 | 4.6 | N | Yes | 2 | WET |
| | Cadmium | 7440-43-9 | T | MG/KG | | U | | 0.028 | 0.028 | 0.20 | N | Yes | 2 | WET |
| | Calcium | 7440-70-2 | T | MG/KG | 947 | | | 50.7 | 50.7 | 169 | Y | Yes | 2 | WET |
| | Chromium | 7440-47-3 | T | MG/KG | | U | | 0.18 | 0.18 | 0.59 | N | Yes | 2 | WET |
| | Cobalt | 7440-48-4 | T | MG/KG | | U* | BL | 0.025 | 0.025 | 0.20 | N | Yes | 2 | WET |
| | Copper | 7440-50-8 | T | MG/KG | | U* | BE | 1.2 | 1.2 | 1.9 | N | Yes | 2 | WET |
| | Lead | 7439-92-1 | T | MG/KG | | U | | 0.026 | 0.026 | 0.087 | N | Yes | 1 | WET |
| | Lithium | 7439-93-2 | T | MG/KG | | U | | 0.042 | 0.042 | 0.20 | N | Yes | 2 | WET |
| | Molybdenum | 7439-98-7 | T | MG/KG | | U | | 0.072 | 0.072 | 0.24 | N | Yes | 2 | WET |
| | Nickel | 7440-02-0 | T | MG/KG | | U | | 0.082 | 0.082 | 0.27 | N | Yes | 2 | WET |
| | Selenium | 7782-49-2 | T | MG/KG | 1.0 | | | 0.10 | 0.10 | 0.34 | Y | Yes | 2 | WET |
| | Silver | 7440-22-4 | T | MG/KG | | U | | 0.022 | 0.022 | 0.10 | N | Yes | 2 | WET |
| | Strontium | 7440-24-6 | T | MG/KG | 1.1 | | | 0.32 | 0.32 | 1.1 | Y | Yes | 2 | WET |
| | Thallium | 7440-28-0 | T | MG/KG | | U | | 0.013 | 0.013 | 0.10 | N | Yes | 1 | WET |
| | Vanadium | 7440-62-2 | T | MG/KG | | U | | 0.067 | 0.067 | 0.22 | N | Yes | 2 | WET |
| | Zinc | 7440-66-6 | T | MG/KG | 40.5 | | | 3.4 | 3.4 | 11.5 | Y | Yes | 2 | WET |
| SW-846 7473 | Mercury | 7439-97-6 | T | MG/KG | | U* | BL | 0.0031 | 0.0031 | 0.019 | N | Yes | 1 | WET |

**TVA TDEC Program**
**Facility: Cumberland Fossil Plant**
**SDG: 40182297**

| | |
|---|---|
| **Lab Sample ID** | 40182297008 |
| **Sys Sample Code** | CUF-FH-CC-CURU-O-20180502 |
| **Sample Name** | CUF-FH-CC-CURU-O-20180502 |
| **Sample Date** | 5/2/2018 1:00:00 PM |
| **Location** | CURU |
| **Sample Type** | N |
| **Parent Sample** | |

| Analytic Method | Chemical Name | CAS Rn | Fraction | Result Unit | Final Result | Final Qual | Reason code | Final MDL | Final RL | Final QL | Final Detect | Final Report | DF | Basis |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| ASTM D2974-87 | Percent Moisture | MOISTURE | N | % | 60.1 | | | 0.10 | 0.10 | 0.10 | Y | Yes | 1 | WET |
| SW-846 6020A | Antimony | 7440-36-0 | T | MG/KG | | U | | 0.031 | 0.031 | 0.19 | N | Yes | 2 | WET |
| | Arsenic | 7440-38-2 | T | MG/KG | | U | | 0.058 | 0.058 | 0.19 | N | Yes | 2 | WET |
| | Barium | 7440-39-3 | T | MG/KG | | U* | BE | 0.21 | 0.21 | 0.21 | N | Yes | 2 | WET |
| | Beryllium | 7440-41-7 | T | MG/KG | | U | | 0.064 | 0.064 | 0.21 | N | Yes | 2 | WET |
| | Boron | 7440-42-8 | T | MG/KG | | U | | 1.3 | 1.3 | 4.5 | N | Yes | 2 | WET |
| | Cadmium | 7440-43-9 | T | MG/KG | | U | | 0.027 | 0.027 | 0.19 | N | Yes | 2 | WET |
| | Calcium | 7440-70-2 | T | MG/KG | 873 | | | 48.8 | 48.8 | 163 | Y | Yes | 2 | WET |
| | Chromium | 7440-47-3 | T | MG/KG | | U | | 0.17 | 0.17 | 0.57 | N | Yes | 2 | WET |
| | Cobalt | 7440-48-4 | T | MG/KG | | U* | BL | 0.034 | 0.034 | 0.19 | N | Yes | 2 | WET |
| | Copper | 7440-50-8 | T | MG/KG | | U* | BE | 1.5 | 1.5 | 1.8 | N | Yes | 2 | WET |
| | Lead | 7439-92-1 | T | MG/KG | | U | | 0.025 | 0.025 | 0.084 | N | Yes | 1 | WET |
| | Lithium | 7439-93-2 | T | MG/KG | | U | | 0.040 | 0.040 | 0.19 | N | Yes | 2 | WET |
| | Molybdenum | 7439-98-7 | T | MG/KG | | U | | 0.069 | 0.069 | 0.23 | N | Yes | 2 | WET |
| | Nickel | 7440-02-0 | T | MG/KG | | U | | 0.079 | 0.079 | 0.26 | N | Yes | 2 | WET |
| | Selenium | 7782-49-2 | T | MG/KG | 1.2 | | | 0.097 | 0.097 | 0.32 | Y | Yes | 2 | WET |
| | Silver | 7440-22-4 | T | MG/KG | | U | | 0.021 | 0.021 | 0.096 | N | Yes | 2 | WET |
| | Strontium | 7440-24-6 | T | MG/KG | 1.1 | | | 0.31 | 0.31 | 1.0 | Y | Yes | 2 | WET |
| | Thallium | 7440-28-0 | T | MG/KG | | U | | 0.012 | 0.012 | 0.096 | N | Yes | 1 | WET |
| | Vanadium | 7440-62-2 | T | MG/KG | | U | | 0.064 | 0.064 | 0.21 | N | Yes | 2 | WET |
| | Zinc | 7440-66-6 | T | MG/KG | 45.6 | | | 3.3 | 3.3 | 11.0 | Y | Yes | 2 | WET |
| SW-846 7473 | Mercury | 7439-97-6 | T | MG/KG | | U | | 0.0030 | 0.0030 | 0.019 | N | Yes | 1 | WET |

**TVA TDEC Program**
**Facility: Cumberland Fossil Plant**
**SDG: 40182297**

| | |
|---|---|
| **Lab Sample ID** | 40182297009 |
| **Sys Sample Code** | CUF-FH-CC-WCD-O-20180410 |
| **Sample Name** | CUF-FH-CC-WCD-O-20180410 |
| **Sample Date** | 4/10/2018 5:15:00 PM |
| **Location** | WCD |
| **Sample Type** | N |
| **Parent Sample** | |

| Analytic Method | Chemical Name | CAS Rn | Fraction | Result Unit | Final Result | Final Qual | Reason code | Final MDL | Final RL | Final QL | Final Detect | Final Report | DF | Basis |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| ASTM D2974-87 | Percent Moisture | MOISTURE | N | % | 60.8 | | | 0.10 | 0.10 | 0.10 | Y | Yes | 1 | WET |
| SW-846 6020A | Antimony | 7440-36-0 | T | MG/KG | | U | | 0.032 | 0.032 | 0.19 | N | Yes | 2 | WET |
| | Arsenic | 7440-38-2 | T | MG/KG | | U | | 0.059 | 0.059 | 0.20 | N | Yes | 2 | WET |
| | Barium | 7440-39-3 | T | MG/KG | | U* | BE | 0.22 | 0.22 | 0.22 | N | Yes | 2 | WET |
| | Beryllium | 7440-41-7 | T | MG/KG | | U | | 0.064 | 0.064 | 0.21 | N | Yes | 2 | WET |
| | Boron | 7440-42-8 | T | MG/KG | | U | | 1.4 | 1.4 | 4.5 | N | Yes | 2 | WET |
| | Cadmium | 7440-43-9 | T | MG/KG | | U | | 0.027 | 0.027 | 0.19 | N | Yes | 2 | WET |
| | Calcium | 7440-70-2 | T | MG/KG | 804 | | | 49.3 | 49.3 | 164 | Y | Yes | 2 | WET |
| | Chromium | 7440-47-3 | T | MG/KG | | U | | 0.17 | 0.17 | 0.57 | N | Yes | 2 | WET |
| | Cobalt | 7440-48-4 | T | MG/KG | | U* | BL | 0.021 | 0.021 | 0.19 | N | Yes | 2 | WET |
| | Copper | 7440-50-8 | T | MG/KG | | U* | BE | 1.1 | 1.1 | 1.8 | N | Yes | 2 | WET |
| | Lead | 7439-92-1 | T | MG/KG | | U | | 0.025 | 0.025 | 0.085 | N | Yes | 1 | WET |
| | Lithium | 7439-93-2 | T | MG/KG | | U | | 0.041 | 0.041 | 0.19 | N | Yes | 2 | WET |
| | Molybdenum | 7439-98-7 | T | MG/KG | | U | | 0.070 | 0.070 | 0.23 | N | Yes | 2 | WET |
| | Nickel | 7440-02-0 | T | MG/KG | | U | | 0.080 | 0.080 | 0.27 | N | Yes | 2 | WET |
| | Selenium | 7782-49-2 | T | MG/KG | 1.0 | | | 0.098 | 0.098 | 0.33 | Y | Yes | 2 | WET |
| | Silver | 7440-22-4 | T | MG/KG | | U | | 0.022 | 0.022 | 0.097 | N | Yes | 2 | WET |
| | Strontium | 7440-24-6 | T | MG/KG | 1.2 | | | 0.31 | 0.31 | 1.0 | Y | Yes | 2 | WET |
| | Thallium | 7440-28-0 | T | MG/KG | | U | | 0.013 | 0.013 | 0.097 | N | Yes | 1 | WET |
| | Vanadium | 7440-62-2 | T | MG/KG | | U | | 0.065 | 0.065 | 0.22 | N | Yes | 2 | WET |
| | Zinc | 7440-66-6 | T | MG/KG | 40.5 | | | 3.3 | 3.3 | 11.2 | Y | Yes | 2 | WET |
| SW-846 7473 | Mercury | 7439-97-6 | T | MG/KG | | U* | BL | 0.0033 | 0.0033 | 0.019 | N | Yes | 1 | WET |

**TVA TDEC Program**
**Facility: Cumberland Fossil Plant**
**SDG: 40182297**

| | |
|---|---|
| **Lab Sample ID** | 40182297010 |
| **Sys Sample Code** | CUF-FH-CC-WCU-O-20180410 |
| **Sample Name** | CUF-FH-CC-WCU-O-20180410 |
| **Sample Date** | 4/10/2018 3:30:00 PM |
| **Location** | WCU |
| **Sample Type** | N |
| **Parent Sample** | |

| Analytic Method | Chemical Name | CAS Rn | Fraction | Result Unit | Final Result | Final Qual | Reason code | Final MDL | Final RL | Final QL | Final Detect | Final Report | DF | Basis |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| ASTM D2974-87 | Percent Moisture | MOISTURE | N | % | 61.1 | | | 0.10 | 0.10 | 0.10 | Y | Yes | 1 | WET |
| SW-846 6020A | Antimony | 7440-36-0 | T | MG/KG | | U | | 0.031 | 0.031 | 0.19 | N | Yes | 2 | WET |
| | Arsenic | 7440-38-2 | T | MG/KG | | U | | 0.058 | 0.058 | 0.19 | N | Yes | 2 | WET |
| | Barium | 7440-39-3 | T | MG/KG | | U* | BE | 0.23 | 0.23 | 0.23 | N | Yes | 2 | WET |
| | Beryllium | 7440-41-7 | T | MG/KG | | U | | 0.063 | 0.063 | 0.21 | N | Yes | 2 | WET |
| | Boron | 7440-42-8 | T | MG/KG | | U | | 1.3 | 1.3 | 4.5 | N | Yes | 2 | WET |
| | Cadmium | 7440-43-9 | T | MG/KG | | U | | 0.027 | 0.027 | 0.19 | N | Yes | 2 | WET |
| | Calcium | 7440-70-2 | T | MG/KG | 939 | | | 48.6 | 48.6 | 162 | Y | Yes | 2 | WET |
| | Chromium | 7440-47-3 | T | MG/KG | | U | | 0.17 | 0.17 | 0.56 | N | Yes | 2 | WET |
| | Cobalt | 7440-48-4 | T | MG/KG | | U* | BL | 0.025 | 0.025 | 0.19 | N | Yes | 2 | WET |
| | Copper | 7440-50-8 | T | MG/KG | | U* | BE | 1.2 | 1.2 | 1.8 | N | Yes | 2 | WET |
| | Lead | 7439-92-1 | T | MG/KG | | U | | 0.025 | 0.025 | 0.084 | N | Yes | 1 | WET |
| | Lithium | 7439-93-2 | T | MG/KG | | U | | 0.040 | 0.040 | 0.19 | N | Yes | 2 | WET |
| | Molybdenum | 7439-98-7 | T | MG/KG | | U | | 0.069 | 0.069 | 0.23 | N | Yes | 2 | WET |
| | Nickel | 7440-02-0 | T | MG/KG | | U | | 0.079 | 0.079 | 0.26 | N | Yes | 2 | WET |
| | Selenium | 7782-49-2 | T | MG/KG | 1.4 | | | 0.097 | 0.097 | 0.32 | Y | Yes | 2 | WET |
| | Silver | 7440-22-4 | T | MG/KG | | U | | 0.021 | 0.021 | 0.096 | N | Yes | 2 | WET |
| | Strontium | 7440-24-6 | T | MG/KG | 1.2 | | | 0.31 | 0.31 | 1.0 | Y | Yes | 2 | WET |
| | Thallium | 7440-28-0 | T | MG/KG | | U | | 0.012 | 0.012 | 0.096 | N | Yes | 1 | WET |
| | Vanadium | 7440-62-2 | T | MG/KG | | U | | 0.064 | 0.064 | 0.21 | N | Yes | 2 | WET |
| | Zinc | 7440-66-6 | T | MG/KG | 50.8 | | | 3.3 | 3.3 | 11.0 | Y | Yes | 2 | WET |
| SW-846 7473 | Mercury | 7439-97-6 | T | MG/KG | | U | | 0.0031 | 0.0031 | 0.020 | N | Yes | 1 | WET |

**TVA TDEC Program**
**Facility: Cumberland Fossil Plant**
**SDG: 40182297**

| | |
|---|---|
| **Lab Sample ID** | 40182297011 |
| **Sys Sample Code** | CUF-FH-LB-CURD-O-20180410 |
| **Sample Name** | CUF-FH-LB-CURD-O-20180410 |
| **Sample Date** | 4/10/2018 1:25:00 PM |
| **Location** | CURD |
| **Sample Type** | N |
| **Parent Sample** | |

| Analytic Method | Chemical Name | CAS Rn | Fraction | Result Unit | Final Result | Final Qual | Reason code | Final MDL | Final RL | Final QL | Final Detect | Final Report | DF | Basis |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| ASTM D2974-87 | Percent Moisture | MOISTURE | N | % | 67.4 | | | 0.10 | 0.10 | 0.10 | Y | Yes | 1 | WET |
| SW-846 6020A | Antimony | 7440-36-0 | T | MG/KG | | U | | 0.032 | 0.032 | 0.20 | N | Yes | 2 | WET |
| | Arsenic | 7440-38-2 | T | MG/KG | | U* | BL,BE | 0.13 | 0.13 | 0.20 | N | Yes | 2 | WET |
| | Barium | 7440-39-3 | T | MG/KG | | U | | 0.060 | 0.060 | 0.20 | N | Yes | 2 | WET |
| | Beryllium | 7440-41-7 | T | MG/KG | | U | | 0.065 | 0.065 | 0.22 | N | Yes | 2 | WET |
| | Boron | 7440-42-8 | T | MG/KG | | U | | 1.4 | 1.4 | 4.5 | N | Yes | 2 | WET |
| | Cadmium | 7440-43-9 | T | MG/KG | | U | | 0.028 | 0.028 | 0.20 | N | Yes | 2 | WET |
| | Calcium | 7440-70-2 | T | MG/KG | 106 | J | RL | 49.6 | 49.6 | 165 | Y | Yes | 2 | WET |
| | Chromium | 7440-47-3 | T | MG/KG | | U | | 0.17 | 0.17 | 0.58 | N | Yes | 2 | WET |
| | Cobalt | 7440-48-4 | T | MG/KG | | U* | BL | 0.031 | 0.031 | 0.20 | N | Yes | 2 | WET |
| | Copper | 7440-50-8 | T | MG/KG | | U* | BE | 1.3 | 1.3 | 1.9 | N | Yes | 2 | WET |
| | Lead | 7439-92-1 | T | MG/KG | | U | | 0.026 | 0.026 | 0.085 | N | Yes | 1 | WET |
| | Lithium | 7439-93-2 | T | MG/KG | | U | | 0.041 | 0.041 | 0.20 | N | Yes | 2 | WET |
| | Molybdenum | 7439-98-7 | T | MG/KG | | U | | 0.070 | 0.070 | 0.23 | N | Yes | 2 | WET |
| | Nickel | 7440-02-0 | T | MG/KG | | U | | 0.080 | 0.080 | 0.27 | N | Yes | 2 | WET |
| | Selenium | 7782-49-2 | T | MG/KG | 0.86 | | | 0.099 | 0.099 | 0.33 | Y | Yes | 2 | WET |
| | Silver | 7440-22-4 | T | MG/KG | | U | | 0.022 | 0.022 | 0.098 | N | Yes | 2 | WET |
| | Strontium | 7440-24-6 | T | MG/KG | | U | | 0.31 | 0.31 | 1.0 | N | Yes | 2 | WET |
| | Thallium | 7440-28-0 | T | MG/KG | | U | | 0.013 | 0.013 | 0.098 | N | Yes | 1 | WET |
| | Vanadium | 7440-62-2 | T | MG/KG | | U | | 0.065 | 0.065 | 0.22 | N | Yes | 2 | WET |
| | Zinc | 7440-66-6 | T | MG/KG | 30.1 | | | 3.4 | 3.4 | 11.2 | Y | Yes | 2 | WET |
| SW-846 7473 | Mercury | 7439-97-6 | T | MG/KG | | U* | BL | 0.0059 | 0.0059 | 0.019 | N | Yes | 1 | WET |

| | |
|---|---|
| **Lab Sample ID** | 40182297012 |
| **Sys Sample Code** | CUF-FH-LB-CURA-O-20180410 |
| **Sample Name** | CUF-FH-LB-CURA-O-20180410 |
| **Sample Date** | 4/10/2018 11:15:00 AM |
| **Location** | CURA |
| **Sample Type** | N |
| **Parent Sample** | |

| Analytic Method | Chemical Name | CAS Rn | Fraction | Result Unit | Final Result | Final Qual | Reason code | Final MDL | Final RL | Final QL | Final Detect | Final Report | DF | Basis |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| ASTM D2974-87 | Percent Moisture | MOISTURE | N | % | 66.6 | | | 0.10 | 0.10 | 0.10 | Y | Yes | 1 | WET |
| SW-846 6020A | Antimony | 7440-36-0 | T | MG/KG | | U | | 0.032 | 0.032 | 0.20 | N | Yes | 2 | WET |
| | Arsenic | 7440-38-2 | T | MG/KG | | U* | BL,BE | 0.12 | 0.12 | 0.20 | N | Yes | 2 | WET |
| | Barium | 7440-39-3 | T | MG/KG | | U | | 0.060 | 0.060 | 0.20 | N | Yes | 2 | WET |
| | Beryllium | 7440-41-7 | T | MG/KG | | U | | 0.065 | 0.065 | 0.22 | N | Yes | 2 | WET |
| | Boron | 7440-42-8 | T | MG/KG | | U | | 1.4 | 1.4 | 4.6 | N | Yes | 2 | WET |
| | Cadmium | 7440-43-9 | T | MG/KG | | U | | 0.028 | 0.028 | 0.20 | N | Yes | 2 | WET |
| | Calcium | 7440-70-2 | T | MG/KG | 111 | J | RL | 49.8 | 49.8 | 166 | Y | Yes | 2 | WET |
| | Chromium | 7440-47-3 | T | MG/KG | | U | | 0.17 | 0.17 | 0.58 | N | Yes | 2 | WET |
| | Cobalt | 7440-48-4 | T | MG/KG | | U* | BL | 0.038 | 0.038 | 0.20 | N | Yes | 2 | WET |
| | Copper | 7440-50-8 | T | MG/KG | | U* | BE | 1.2 | 1.2 | 1.9 | N | Yes | 2 | WET |
| | Lead | 7439-92-1 | T | MG/KG | | U | | 0.026 | 0.026 | 0.086 | N | Yes | 1 | WET |
| | Lithium | 7439-93-2 | T | MG/KG | | U | | 0.041 | 0.041 | 0.20 | N | Yes | 2 | WET |
| | Molybdenum | 7439-98-7 | T | MG/KG | | U | | 0.070 | 0.070 | 0.23 | N | Yes | 2 | WET |
| | Nickel | 7440-02-0 | T | MG/KG | | U | | 0.081 | 0.081 | 0.27 | N | Yes | 2 | WET |
| | Selenium | 7782-49-2 | T | MG/KG | 0.87 | | | 0.099 | 0.099 | 0.33 | Y | Yes | 2 | WET |
| | Silver | 7440-22-4 | T | MG/KG | | U | | 0.022 | 0.022 | 0.098 | N | Yes | 2 | WET |
| | Strontium | 7440-24-6 | T | MG/KG | | U | | 0.32 | 0.32 | 1.1 | N | Yes | 2 | WET |
| | Thallium | 7440-28-0 | T | MG/KG | | U | | 0.013 | 0.013 | 0.098 | N | Yes | 1 | WET |
| | Vanadium | 7440-62-2 | T | MG/KG | | U | | 0.065 | 0.065 | 0.22 | N | Yes | 2 | WET |
| | Zinc | 7440-66-6 | T | MG/KG | 31.0 | | | 3.4 | 3.4 | 11.3 | Y | Yes | 2 | WET |
| SW-846 7473 | Mercury | 7439-97-6 | T | MG/KG | | U* | BL | 0.0044 | 0.0044 | 0.019 | N | Yes | 1 | WET |

**TVA TDEC Program**
**Facility: Cumberland Fossil Plant**
**SDG: 40182297**

| | |
|---|---|
| **Lab Sample ID** | 40182297013 |
| **Sys Sample Code** | CUF-FH-LB-CURU-O-20180509 |
| **Sample Name** | CUF-FH-LB-CURU-O-20180509 |
| **Sample Date** | 5/9/2018 11:20:00 AM |
| **Location** | CURU |
| **Sample Type** | N |
| **Parent Sample** | |

| Analytic Method | Chemical Name | CAS Rn | Fraction | Result Unit | Final Result | Final Qual | Reason code | Final MDL | Final RL | Final QL | Final Detect | Final Report | DF | Basis |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| ASTM D2974-87 | Percent Moisture | MOISTURE | N | % | 68.5 | | | 0.10 | 0.10 | 0.10 | Y | Yes | 1 | WET |
| SW-846 6020A | Antimony | 7440-36-0 | T | MG/KG | | U | | 0.032 | 0.032 | 0.20 | N | Yes | 2 | WET |
| | Arsenic | 7440-38-2 | T | MG/KG | | U* | BL,BE | 0.15 | 0.15 | 0.20 | N | Yes | 2 | WET |
| | Barium | 7440-39-3 | T | MG/KG | | U | | 0.061 | 0.061 | 0.20 | N | Yes | 2 | WET |
| | Beryllium | 7440-41-7 | T | MG/KG | | U | | 0.066 | 0.066 | 0.22 | N | Yes | 2 | WET |
| | Boron | 7440-42-8 | T | MG/KG | | U | | 1.4 | 1.4 | 4.6 | N | Yes | 2 | WET |
| | Cadmium | 7440-43-9 | T | MG/KG | | U | | 0.028 | 0.028 | 0.20 | N | Yes | 2 | WET |
| | Calcium | 7440-70-2 | T | MG/KG | 181 | | | 50.3 | 50.3 | 168 | Y | Yes | 2 | WET |
| | Chromium | 7440-47-3 | T | MG/KG | | U | | 0.18 | 0.18 | 0.58 | N | Yes | 2 | WET |
| | Cobalt | 7440-48-4 | T | MG/KG | | U* | BL | 0.064 | 0.064 | 0.20 | N | Yes | 2 | WET |
| | Copper | 7440-50-8 | T | MG/KG | | U* | BE | 1.3 | 1.3 | 1.9 | N | Yes | 2 | WET |
| | Lead | 7439-92-1 | T | MG/KG | | U | | 0.026 | 0.026 | 0.086 | N | Yes | 1 | WET |
| | Lithium | 7439-93-2 | T | MG/KG | | U | | 0.042 | 0.042 | 0.20 | N | Yes | 2 | WET |
| | Molybdenum | 7439-98-7 | T | MG/KG | | U* | BL | 0.071 | 0.071 | 0.24 | N | Yes | 2 | WET |
| | Nickel | 7440-02-0 | T | MG/KG | 0.12 | J | RL | 0.081 | 0.081 | 0.27 | Y | Yes | 2 | WET |
| | Selenium | 7782-49-2 | T | MG/KG | 0.94 | | | 0.10 | 0.10 | 0.33 | Y | Yes | 2 | WET |
| | Silver | 7440-22-4 | T | MG/KG | | U | | 0.022 | 0.022 | 0.099 | N | Yes | 2 | WET |
| | Strontium | 7440-24-6 | T | MG/KG | | U | | 0.32 | 0.32 | 1.1 | N | Yes | 2 | WET |
| | Thallium | 7440-28-0 | T | MG/KG | | U | | 0.013 | 0.013 | 0.099 | N | Yes | 1 | WET |
| | Vanadium | 7440-62-2 | T | MG/KG | | U | | 0.066 | 0.066 | 0.22 | N | Yes | 2 | WET |
| | Zinc | 7440-66-6 | T | MG/KG | 35.7 | | | 3.4 | 3.4 | 11.4 | Y | Yes | 2 | WET |
| SW-846 7473 | Mercury | 7439-97-6 | T | MG/KG | | U* | BL | 0.013 | 0.013 | 0.019 | N | Yes | 1 | WET |

**TVA TDEC Program**
**Facility: Cumberland Fossil Plant**
**SDG: 40182297**

| | |
|---|---|
| **Lab Sample ID** | 40182297014 |
| **Sys Sample Code** | CUF-FH-LB-WCD-O-20180410 |
| **Sample Name** | CUF-FH-LB-WCD-O-20180410 |
| **Sample Date** | 4/10/2018 5:15:00 PM |
| **Location** | WCD |
| **Sample Type** | N |
| **Parent Sample** | |

| Analytic Method | Chemical Name | CAS Rn | Fraction | Result Unit | Final Result | Final Qual | Reason code | Final MDL | Final RL | Final QL | Final Detect | Final Report | DF | Basis |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| ASTM D2974-87 | Percent Moisture | MOISTURE | N | % | 67.3 | | | 0.10 | 0.10 | 0.10 | Y | Yes | 1 | WET |
| SW-846 6020A | Antimony | 7440-36-0 | T | MG/KG | | U | | 0.032 | 0.032 | 0.19 | N | Yes | 2 | WET |
| | Arsenic | 7440-38-2 | T | MG/KG | | U* | BL,BE | 0.14 | 0.14 | 0.20 | N | Yes | 2 | WET |
| | Barium | 7440-39-3 | T | MG/KG | | U | | 0.059 | 0.059 | 0.20 | N | Yes | 2 | WET |
| | Beryllium | 7440-41-7 | T | MG/KG | | U | | 0.064 | 0.064 | 0.21 | N | Yes | 2 | WET |
| | Boron | 7440-42-8 | T | MG/KG | | U | | 1.4 | 1.4 | 4.5 | N | Yes | 2 | WET |
| | Cadmium | 7440-43-9 | T | MG/KG | | U | | 0.027 | 0.027 | 0.19 | N | Yes | 2 | WET |
| | Calcium | 7440-70-2 | T | MG/KG | 120 | J | RL | 49.3 | 49.3 | 164 | Y | Yes | 2 | WET |
| | Chromium | 7440-47-3 | T | MG/KG | | U | | 0.17 | 0.17 | 0.57 | N | Yes | 2 | WET |
| | Cobalt | 7440-48-4 | T | MG/KG | | U* | BL | 0.043 | 0.043 | 0.19 | N | Yes | 2 | WET |
| | Copper | 7440-50-8 | T | MG/KG | | U* | BE | 1.3 | 1.3 | 1.8 | N | Yes | 2 | WET |
| | Lead | 7439-92-1 | T | MG/KG | | U | | 0.025 | 0.025 | 0.085 | N | Yes | 1 | WET |
| | Lithium | 7439-93-2 | T | MG/KG | | U | | 0.041 | 0.041 | 0.19 | N | Yes | 2 | WET |
| | Molybdenum | 7439-98-7 | T | MG/KG | | U | | 0.069 | 0.069 | 0.23 | N | Yes | 2 | WET |
| | Nickel | 7440-02-0 | T | MG/KG | | U | | 0.080 | 0.080 | 0.27 | N | Yes | 2 | WET |
| | Selenium | 7782-49-2 | T | MG/KG | 0.86 | | | 0.098 | 0.098 | 0.33 | Y | Yes | 2 | WET |
| | Silver | 7440-22-4 | T | MG/KG | | U | | 0.022 | 0.022 | 0.097 | N | Yes | 2 | WET |
| | Strontium | 7440-24-6 | T | MG/KG | | U | | 0.31 | 0.31 | 1.0 | N | Yes | 2 | WET |
| | Thallium | 7440-28-0 | T | MG/KG | | U | | 0.013 | 0.013 | 0.097 | N | Yes | 1 | WET |
| | Vanadium | 7440-62-2 | T | MG/KG | | U | | 0.065 | 0.065 | 0.22 | N | Yes | 2 | WET |
| | Zinc | 7440-66-6 | T | MG/KG | 31.0 | | | 3.3 | 3.3 | 11.2 | Y | Yes | 2 | WET |
| SW-846 7473 | Mercury | 7439-97-6 | T | MG/KG | | U* | BL | 0.0055 | 0.0055 | 0.020 | N | Yes | 1 | WET |

**TVA TDEC Program**
**Facility: Cumberland Fossil Plant**
**SDG: 40182297**

| | |
|---|---|
| **Lab Sample ID** | 40182297015 |
| **Sys Sample Code** | CUF-FH-LB-WCU-O-20180410 |
| **Sample Name** | CUF-FH-LB-WCU-O-20180410 |
| **Sample Date** | 4/10/2018 3:30:00 PM |
| **Location** | WCU |
| **Sample Type** | N |
| **Parent Sample** | |

| Analytic Method | Chemical Name | CAS Rn | Fraction | Result Unit | Final Result | Final Qual | Reason code | Final MDL | Final RL | Final QL | Final Detect | Final Report | DF | Basis |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| ASTM D2974-87 | Percent Moisture | MOISTURE | N | % | 67.4 | | | 0.10 | 0.10 | 0.10 | Y | Yes | 1 | WET |
| SW-846 6020A | Antimony | 7440-36-0 | T | MG/KG | | U | | 0.032 | 0.032 | 0.20 | N | Yes | 2 | WET |
| | Arsenic | 7440-38-2 | T | MG/KG | | U* | BL,BE | 0.15 | 0.15 | 0.20 | N | Yes | 2 | WET |
| | Barium | 7440-39-3 | T | MG/KG | | U | | 0.061 | 0.061 | 0.20 | N | Yes | 2 | WET |
| | Beryllium | 7440-41-7 | T | MG/KG | | U | | 0.066 | 0.066 | 0.22 | N | Yes | 2 | WET |
| | Boron | 7440-42-8 | T | MG/KG | | U | | 1.4 | 1.4 | 4.6 | N | Yes | 2 | WET |
| | Cadmium | 7440-43-9 | T | MG/KG | | U | | 0.028 | 0.028 | 0.20 | N | Yes | 2 | WET |
| | Calcium | 7440-70-2 | T | MG/KG | 112 | J | RL | 50.3 | 50.3 | 168 | Y | Yes | 2 | WET |
| | Chromium | 7440-47-3 | T | MG/KG | | U | | 0.18 | 0.18 | 0.58 | N | Yes | 2 | WET |
| | Cobalt | 7440-48-4 | T | MG/KG | | U* | BL | 0.033 | 0.033 | 0.20 | N | Yes | 2 | WET |
| | Copper | 7440-50-8 | T | MG/KG | | U* | BE | 1.2 | 1.2 | 1.9 | N | Yes | 2 | WET |
| | Lead | 7439-92-1 | T | MG/KG | | U | | 0.026 | 0.026 | 0.086 | N | Yes | 1 | WET |
| | Lithium | 7439-93-2 | T | MG/KG | | U | | 0.042 | 0.042 | 0.20 | N | Yes | 2 | WET |
| | Molybdenum | 7439-98-7 | T | MG/KG | | U | | 0.071 | 0.071 | 0.24 | N | Yes | 2 | WET |
| | Nickel | 7440-02-0 | T | MG/KG | | U | | 0.081 | 0.081 | 0.27 | N | Yes | 2 | WET |
| | Selenium | 7782-49-2 | T | MG/KG | 0.81 | | | 0.10 | 0.10 | 0.33 | Y | Yes | 2 | WET |
| | Silver | 7440-22-4 | T | MG/KG | | U | | 0.022 | 0.022 | 0.099 | N | Yes | 2 | WET |
| | Strontium | 7440-24-6 | T | MG/KG | | U | | 0.32 | 0.32 | 1.1 | N | Yes | 2 | WET |
| | Thallium | 7440-28-0 | T | MG/KG | | U | | 0.013 | 0.013 | 0.099 | N | Yes | 1 | WET |
| | Vanadium | 7440-62-2 | T | MG/KG | | U | | 0.066 | 0.066 | 0.22 | N | Yes | 2 | WET |
| | Zinc | 7440-66-6 | T | MG/KG | 28.8 | | | 3.4 | 3.4 | 11.4 | Y | Yes | 2 | WET |
| SW-846 7473 | Mercury | 7439-97-6 | T | MG/KG | | U* | BL | 0.0091 | 0.0091 | 0.019 | N | Yes | 1 | WET |

**TVA TDEC Program**
**Facility: Cumberland Fossil Plant**
**SDG: 40182297**

| | |
|---|---|
| **Lab Sample ID** | 40182297016 |
| **Sys Sample Code** | CUF-FH-RS-CURD-O-20180509 |
| **Sample Name** | CUF-FH-RS-CURD-O-20180509 |
| **Sample Date** | 5/9/2018 5:50:00 PM |
| **Location** | CURD |
| **Sample Type** | N |
| **Parent Sample** | |

| Analytic Method | Chemical Name | CAS Rn | Fraction | Result Unit | Final Result | Final Qual | Reason code | Final MDL | Final RL | Final QL | Final Detect | Final Report | DF | Basis |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| ASTM D2974-87 | Percent Moisture | MOISTURE | N | % | 66.8 | | | 0.10 | 0.10 | 0.10 | Y | Yes | 1 | WET |
| SW-846 6020A | Antimony | 7440-36-0 | T | MG/KG | | U | | 0.032 | 0.032 | 0.19 | N | Yes | 2 | WET |
| | Arsenic | 7440-38-2 | T | MG/KG | 0.30 | | | 0.059 | 0.059 | 0.20 | Y | Yes | 2 | WET |
| | Barium | 7440-39-3 | T | MG/KG | | U* | BE | 0.13 | 0.13 | 0.20 | N | Yes | 2 | WET |
| | Beryllium | 7440-41-7 | T | MG/KG | | U | | 0.064 | 0.064 | 0.21 | N | Yes | 2 | WET |
| | Boron | 7440-42-8 | T | MG/KG | | U | | 1.4 | 1.4 | 4.5 | N | Yes | 2 | WET |
| | Cadmium | 7440-43-9 | T | MG/KG | | U | | 0.027 | 0.027 | 0.19 | N | Yes | 2 | WET |
| | Calcium | 7440-70-2 | T | MG/KG | 145 | J | RL | 49.4 | 49.4 | 165 | Y | Yes | 2 | WET |
| | Chromium | 7440-47-3 | T | MG/KG | | U | | 0.17 | 0.17 | 0.57 | N | Yes | 2 | WET |
| | Cobalt | 7440-48-4 | T | MG/KG | | U* | BL | 0.019 | 0.019 | 0.19 | N | Yes | 2 | WET |
| | Copper | 7440-50-8 | T | MG/KG | | U* | BE | 1.1 | 1.1 | 1.8 | N | Yes | 2 | WET |
| | Lead | 7439-92-1 | T | MG/KG | | U | | 0.025 | 0.025 | 0.085 | N | Yes | 1 | WET |
| | Lithium | 7439-93-2 | T | MG/KG | | U | | 0.041 | 0.041 | 0.19 | N | Yes | 2 | WET |
| | Molybdenum | 7439-98-7 | T | MG/KG | | U | | 0.070 | 0.070 | 0.23 | N | Yes | 2 | WET |
| | Nickel | 7440-02-0 | T | MG/KG | | U | | 0.080 | 0.080 | 0.27 | N | Yes | 2 | WET |
| | Selenium | 7782-49-2 | T | MG/KG | 0.77 | | | 0.099 | 0.099 | 0.33 | Y | Yes | 2 | WET |
| | Silver | 7440-22-4 | T | MG/KG | | U | | 0.022 | 0.022 | 0.097 | N | Yes | 2 | WET |
| | Strontium | 7440-24-6 | T | MG/KG | | U | | 0.31 | 0.31 | 1.0 | N | Yes | 2 | WET |
| | Thallium | 7440-28-0 | T | MG/KG | | U | | 0.013 | 0.013 | 0.097 | N | Yes | 1 | WET |
| | Vanadium | 7440-62-2 | T | MG/KG | | U* | BL | 0.067 | 0.067 | 0.22 | N | Yes | 2 | WET |
| | Zinc | 7440-66-6 | T | MG/KG | 29.9 | | | 3.4 | 3.4 | 11.2 | Y | Yes | 2 | WET |
| SW-846 7473 | Mercury | 7439-97-6 | T | MG/KG | | U | | 0.0031 | 0.0031 | 0.019 | N | Yes | 1 | WET |

| | |
|---|---|
| **Lab Sample ID** | 40182297017 |
| **Sys Sample Code** | CUF-FH-RS-CURA-O-20180501 |
| **Sample Name** | CUF-FH-RS-CURA-O-20180501 |
| **Sample Date** | 5/1/2018 10:30:00 AM |
| **Location** | CURA |
| **Sample Type** | N |
| **Parent Sample** | |

| Analytic Method | Chemical Name | CAS Rn | Fraction | Result Unit | Final Result | Final Qual | Reason code | Final MDL | Final RL | Final QL | Final Detect | Final Report | DF | Basis |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| ASTM D2974-87 | Percent Moisture | MOISTURE | N | % | 64.2 | | | 0.10 | 0.10 | 0.10 | Y | Yes | 1 | WET |
| SW-846 6020A | Antimony | 7440-36-0 | T | MG/KG | | U | | 0.032 | 0.032 | 0.19 | N | Yes | 2 | WET |
| | Arsenic | 7440-38-2 | T | MG/KG | | U* | BL,BE | 0.066 | 0.066 | 0.19 | N | Yes | 2 | WET |
| | Barium | 7440-39-3 | T | MG/KG | | U* | BE | 0.21 | 0.21 | 0.21 | N | Yes | 2 | WET |
| | Beryllium | 7440-41-7 | T | MG/KG | | U | | 0.064 | 0.064 | 0.21 | N | Yes | 2 | WET |
| | Boron | 7440-42-8 | T | MG/KG | | U | | 1.4 | 1.4 | 4.5 | N | Yes | 2 | WET |
| | Cadmium | 7440-43-9 | T | MG/KG | | U | | 0.027 | 0.027 | 0.19 | N | Yes | 2 | WET |
| | Calcium | 7440-70-2 | T | MG/KG | 175 | | | 49.1 | 49.1 | 164 | Y | Yes | 2 | WET |
| | Chromium | 7440-47-3 | T | MG/KG | | U | | 0.17 | 0.17 | 0.57 | N | Yes | 2 | WET |
| | Cobalt | 7440-48-4 | T | MG/KG | | U* | BL | 0.027 | 0.027 | 0.19 | N | Yes | 2 | WET |
| | Copper | 7440-50-8 | T | MG/KG | | U* | BE | 1.2 | 1.2 | 1.8 | N | Yes | 2 | WET |
| | Lead | 7439-92-1 | T | MG/KG | | U | | 0.025 | 0.025 | 0.084 | N | Yes | 1 | WET |
| | Lithium | 7439-93-2 | T | MG/KG | | U | | 0.041 | 0.041 | 0.19 | N | Yes | 2 | WET |
| | Molybdenum | 7439-98-7 | T | MG/KG | | U | | 0.069 | 0.069 | 0.23 | N | Yes | 2 | WET |
| | Nickel | 7440-02-0 | T | MG/KG | | U | | 0.080 | 0.080 | 0.27 | N | Yes | 2 | WET |
| | Selenium | 7782-49-2 | T | MG/KG | 1.5 | | | 0.098 | 0.098 | 0.33 | Y | Yes | 2 | WET |
| | Silver | 7440-22-4 | T | MG/KG | | U | | 0.022 | 0.022 | 0.097 | N | Yes | 2 | WET |
| | Strontium | 7440-24-6 | T | MG/KG | | U | | 0.31 | 0.31 | 1.0 | N | Yes | 2 | WET |
| | Thallium | 7440-28-0 | T | MG/KG | | U | | 0.013 | 0.013 | 0.097 | N | Yes | 1 | WET |
| | Vanadium | 7440-62-2 | T | MG/KG | | U | | 0.064 | 0.064 | 0.22 | N | Yes | 2 | WET |
| | Zinc | 7440-66-6 | T | MG/KG | 34.4 | | | 3.3 | 3.3 | 11.1 | Y | Yes | 2 | WET |
| SW-846 7473 | Mercury | 7439-97-6 | T | MG/KG | | U* | BL | 0.0052 | 0.0052 | 0.019 | N | Yes | 1 | WET |

**TVA TDEC Program**
**Facility: Cumberland Fossil Plant**
**SDG: 40182297**

| | |
|---|---|
| **Lab Sample ID** | 40182297018 |
| **Sys Sample Code** | CUF-FH-RS-CURU-O-20180502 |
| **Sample Name** | CUF-FH-RS-CURU-O-20180502 |
| **Sample Date** | 5/2/2018 1:00:00 PM |
| **Location** | CURU |
| **Sample Type** | N |
| **Parent Sample** | |

| Analytic Method | Chemical Name | CAS Rn | Fraction | Result Unit | Final Result | Final Qual | Reason code | Final MDL | Final RL | Final QL | Final Detect | Final Report | DF | Basis |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| ASTM D2974-87 | Percent Moisture | MOISTURE | N | % | 67.1 | | | 0.10 | 0.10 | 0.10 | Y | Yes | 1 | WET |
| SW-846 6020A | Antimony | 7440-36-0 | T | MG/KG | | U | | 0.032 | 0.032 | 0.20 | N | Yes | 2 | WET |
| | Arsenic | 7440-38-2 | T | MG/KG | | U* | BL,BE | 0.11 | 0.11 | 0.20 | N | Yes | 2 | WET |
| | Barium | 7440-39-3 | T | MG/KG | | U* | BE | 0.095 | 0.095 | 0.20 | N | Yes | 2 | WET |
| | Beryllium | 7440-41-7 | T | MG/KG | | U | | 0.066 | 0.066 | 0.22 | N | Yes | 2 | WET |
| | Boron | 7440-42-8 | T | MG/KG | | U | | 1.4 | 1.4 | 4.6 | N | Yes | 2 | WET |
| | Cadmium | 7440-43-9 | T | MG/KG | | U | | 0.028 | 0.028 | 0.20 | N | Yes | 2 | WET |
| | Calcium | 7440-70-2 | T | MG/KG | 169 | | | 50.6 | 50.6 | 169 | Y | Yes | 2 | WET |
| | Chromium | 7440-47-3 | T | MG/KG | | U | | 0.18 | 0.18 | 0.59 | N | Yes | 2 | WET |
| | Cobalt | 7440-48-4 | T | MG/KG | | U* | BL | 0.021 | 0.021 | 0.20 | N | Yes | 2 | WET |
| | Copper | 7440-50-8 | T | MG/KG | | U* | BE | 0.73 | 0.73 | 1.9 | N | Yes | 2 | WET |
| | Lead | 7439-92-1 | T | MG/KG | | U | | 0.026 | 0.026 | 0.087 | N | Yes | 1 | WET |
| | Lithium | 7439-93-2 | T | MG/KG | | U | | 0.042 | 0.042 | 0.20 | N | Yes | 2 | WET |
| | Molybdenum | 7439-98-7 | T | MG/KG | | U | | 0.071 | 0.071 | 0.24 | N | Yes | 2 | WET |
| | Nickel | 7440-02-0 | T | MG/KG | | U | | 0.082 | 0.082 | 0.27 | N | Yes | 2 | WET |
| | Selenium | 7782-49-2 | T | MG/KG | 0.89 | | | 0.10 | 0.10 | 0.34 | Y | Yes | 2 | WET |
| | Silver | 7440-22-4 | T | MG/KG | | U | | 0.022 | 0.022 | 0.10 | N | Yes | 2 | WET |
| | Strontium | 7440-24-6 | T | MG/KG | | U | | 0.32 | 0.32 | 1.1 | N | Yes | 2 | WET |
| | Thallium | 7440-28-0 | T | MG/KG | | U | | 0.013 | 0.013 | 0.10 | N | Yes | 1 | WET |
| | Vanadium | 7440-62-2 | T | MG/KG | | U | | 0.066 | 0.066 | 0.22 | N | Yes | 2 | WET |
| | Zinc | 7440-66-6 | T | MG/KG | 29.6 | | | 3.4 | 3.4 | 11.4 | Y | Yes | 2 | WET |
| SW-846 7473 | Mercury | 7439-97-6 | T | MG/KG | | U* | BL | 0.0037 | 0.0037 | 0.018 | N | Yes | 1 | WET |

**TVA TDEC Program**
**Facility: Cumberland Fossil Plant**
**SDG: 40182297**

| | |
|---|---|
| **Lab Sample ID** | 40182297019 |
| **Sys Sample Code** | CUF-FH-RS-WCD-O-20180510 |
| **Sample Name** | CUF-FH-RS-WCD-O-20180510 |
| **Sample Date** | 5/10/2018 10:18:00 AM |
| **Location** | WCD |
| **Sample Type** | N |
| **Parent Sample** | |

| Analytic Method | Chemical Name | CAS Rn | Fraction | Result Unit | Final Result | Final Qual | Reason code | Final MDL | Final RL | Final QL | Final Detect | Final Report | DF | Basis |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| ASTM D2974-87 | Percent Moisture | MOISTURE | N | % | 69.5 | | | 0.10 | 0.10 | 0.10 | Y | Yes | 1 | WET |
| SW-846 6020A | Antimony | 7440-36-0 | T | MG/KG | | U | | 0.032 | 0.032 | 0.20 | N | Yes | 2 | WET |
| | Arsenic | 7440-38-2 | T | MG/KG | | U* | BL,BE | 0.081 | 0.081 | 0.20 | N | Yes | 2 | WET |
| | Barium | 7440-39-3 | T | MG/KG | | U* | BE | 0.11 | 0.11 | 0.20 | N | Yes | 2 | WET |
| | Beryllium | 7440-41-7 | T | MG/KG | | U | | 0.065 | 0.065 | 0.22 | N | Yes | 2 | WET |
| | Boron | 7440-42-8 | T | MG/KG | | U | | 1.4 | 1.4 | 4.6 | N | Yes | 2 | WET |
| | Cadmium | 7440-43-9 | T | MG/KG | | U | | 0.028 | 0.028 | 0.20 | N | Yes | 2 | WET |
| | Calcium | 7440-70-2 | T | MG/KG | 200 | | | 50.0 | 50.0 | 167 | Y | Yes | 2 | WET |
| | Chromium | 7440-47-3 | T | MG/KG | | U | | 0.17 | 0.17 | 0.58 | N | Yes | 2 | WET |
| | Cobalt | 7440-48-4 | T | MG/KG | | U* | BL | 0.043 | 0.043 | 0.20 | N | Yes | 2 | WET |
| | Copper | 7440-50-8 | T | MG/KG | | U* | BE | 0.68 | 0.68 | 1.9 | N | Yes | 2 | WET |
| | Lead | 7439-92-1 | T | MG/KG | | U | | 0.026 | 0.026 | 0.086 | N | Yes | 1 | WET |
| | Lithium | 7439-93-2 | T | MG/KG | | U | | 0.041 | 0.041 | 0.20 | N | Yes | 2 | WET |
| | Molybdenum | 7439-98-7 | T | MG/KG | | U* | BL | 0.071 | 0.071 | 0.23 | N | Yes | 2 | WET |
| | Nickel | 7440-02-0 | T | MG/KG | | U | | 0.081 | 0.081 | 0.27 | N | Yes | 2 | WET |
| | Selenium | 7782-49-2 | T | MG/KG | 1.0 | | | 0.10 | 0.10 | 0.33 | Y | Yes | 2 | WET |
| | Silver | 7440-22-4 | T | MG/KG | | U | | 0.022 | 0.022 | 0.098 | N | Yes | 2 | WET |
| | Strontium | 7440-24-6 | T | MG/KG | | U | | 0.32 | 0.32 | 1.1 | N | Yes | 2 | WET |
| | Thallium | 7440-28-0 | T | MG/KG | | U | | 0.013 | 0.013 | 0.098 | N | Yes | 1 | WET |
| | Vanadium | 7440-62-2 | T | MG/KG | | U* | BL | 0.080 | 0.080 | 0.22 | N | Yes | 2 | WET |
| | Zinc | 7440-66-6 | T | MG/KG | 39.5 | | | 3.4 | 3.4 | 11.3 | Y | Yes | 2 | WET |
| SW-846 7473 | Mercury | 7439-97-6 | T | MG/KG | | U* | BL | 0.0054 | 0.0054 | 0.020 | N | Yes | 1 | WET |

**TVA TDEC Program**
**Facility: Cumberland Fossil Plant**
**SDG: 40182297**

| | |
|---|---|
| **Lab Sample ID** | 40182297020 |
| **Sys Sample Code** | CUF-FH-RS-WCU-O-20180501 |
| **Sample Name** | CUF-FH-RS-WCU-O-20180501 |
| **Sample Date** | 5/1/2018 4:40:00 PM |
| **Location** | WCU |
| **Sample Type** | N |
| **Parent Sample** | |

| Analytic Method | Chemical Name | CAS Rn | Fraction | Result Unit | Final Result | Final Qual | Reason code | Final MDL | Final RL | Final QL | Final Detect | Final Report | DF | Basis |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| ASTM D2974-87 | Percent Moisture | MOISTURE | N | % | 68.0 | | | 0.10 | 0.10 | 0.10 | Y | Yes | 1 | WET |
| SW-846 6020A | Antimony | 7440-36-0 | T | MG/KG | | U | | 0.032 | 0.032 | 0.20 | N | Yes | 2 | WET |
| | Arsenic | 7440-38-2 | T | MG/KG | | U* | BL,BE | 0.10 | 0.10 | 0.20 | N | Yes | 2 | WET |
| | Barium | 7440-39-3 | T | MG/KG | | U* | BE | 0.11 | 0.11 | 0.20 | N | Yes | 2 | WET |
| | Beryllium | 7440-41-7 | T | MG/KG | | U | | 0.065 | 0.065 | 0.22 | N | Yes | 2 | WET |
| | Boron | 7440-42-8 | T | MG/KG | | U | | 1.4 | 1.4 | 4.5 | N | Yes | 2 | WET |
| | Cadmium | 7440-43-9 | T | MG/KG | | U | | 0.027 | 0.027 | 0.20 | N | Yes | 2 | WET |
| | Calcium | 7440-70-2 | T | MG/KG | 208 | | | 49.5 | 49.5 | 165 | Y | Yes | 2 | WET |
| | Chromium | 7440-47-3 | T | MG/KG | | U | | 0.17 | 0.17 | 0.58 | N | Yes | 2 | WET |
| | Cobalt | 7440-48-4 | T | MG/KG | | U* | BL | 0.028 | 0.028 | 0.20 | N | Yes | 2 | WET |
| | Copper | 7440-50-8 | T | MG/KG | | U* | BE | 0.78 | 0.78 | 1.8 | N | Yes | 2 | WET |
| | Lead | 7439-92-1 | T | MG/KG | | U | | 0.026 | 0.026 | 0.085 | N | Yes | 1 | WET |
| | Lithium | 7439-93-2 | T | MG/KG | | U | | 0.041 | 0.041 | 0.20 | N | Yes | 2 | WET |
| | Molybdenum | 7439-98-7 | T | MG/KG | | U | | 0.070 | 0.070 | 0.23 | N | Yes | 2 | WET |
| | Nickel | 7440-02-0 | T | MG/KG | | U | | 0.080 | 0.080 | 0.27 | N | Yes | 2 | WET |
| | Selenium | 7782-49-2 | T | MG/KG | 1.1 | | | 0.099 | 0.099 | 0.33 | Y | Yes | 2 | WET |
| | Silver | 7440-22-4 | T | MG/KG | | U | | 0.022 | 0.022 | 0.098 | N | Yes | 2 | WET |
| | Strontium | 7440-24-6 | T | MG/KG | | U | | 0.31 | 0.31 | 1.0 | N | Yes | 2 | WET |
| | Thallium | 7440-28-0 | T | MG/KG | | U | | 0.013 | 0.013 | 0.098 | N | Yes | 1 | WET |
| | Vanadium | 7440-62-2 | T | MG/KG | | U | | 0.065 | 0.065 | 0.22 | N | Yes | 2 | WET |
| | Zinc | 7440-66-6 | T | MG/KG | 30.8 | | | 3.4 | 3.4 | 11.2 | Y | Yes | 2 | WET |
| SW-846 7473 | Mercury | 7439-97-6 | T | MG/KG | | U | | 0.0031 | 0.0031 | 0.020 | N | Yes | 1 | WET |

## C. WORK ORDER 40182299

**TVA TDEC Program**
**Facility: Cumberland Fossil Plant**
**SDG: 40182299**

| | |
|---|---|
| **Lab Sample ID** | 40182299001 |
| **Sys Sample Code** | CUF-FH-SH-CURD-WF-20180410 |
| **Sample Name** | CUF-FH-SH-CURD-WF-20180410 |
| **Sample Date** | 4/10/2018 1:25:00 PM |
| **Location** | CURD |
| **Sample Type** | N |
| **Parent Sample** | |

| Analytic Method | Chemical Name | CAS Rn | Fraction | Result Unit | Final Result | Final Qual | Reason code | Final MDL | Final RL | Final QL | Final Detect | Final Report | DF | Basis |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| ASTM D2974-87 | Percent Moisture | MOISTURE | N | % | 78.0 | | | 0.10 | 0.10 | 0.10 | Y | Yes | 1 | WET |
| SW-846 6020A | Antimony | 7440-36-0 | T | MG/KG | | U | | 0.016 | 0.016 | 0.10 | N | Yes | 1 | WET |
| | Arsenic | 7440-38-2 | T | MG/KG | | U* | BE | 0.15 | 0.15 | 0.50 | N | Yes | 5 | WET |
| | Barium | 7440-39-3 | T | MG/KG | 3.0 | | | 0.031 | 0.031 | 0.10 | Y | Yes | 1 | WET |
| | Beryllium | 7440-41-7 | T | MG/KG | | U | | 0.17 | 0.17 | 0.55 | N | Yes | 5 | WET |
| | Boron | 7440-42-8 | T | MG/KG | | U | | 3.5 | 3.5 | 11.6 | N | Yes | 5 | WET |
| | Cadmium | 7440-43-9 | T | MG/KG | | U* | BE | 0.051 | 0.051 | 0.10 | N | Yes | 1 | WET |
| | Calcium | 7440-70-2 | T | MG/KG | 12100 | | | 127 | 127 | 422 | Y | Yes | 5 | WET |
| | Chromium | 7440-47-3 | T | MG/KG | | UJ | L- | 0.44 | 0.44 | 1.5 | N | Yes | 5 | WET |
| | Cobalt | 7440-48-4 | T | MG/KG | 0.082 | J | RL | 0.041 | 0.041 | 0.50 | Y | Yes | 5 | WET |
| | Copper | 7440-50-8 | T | MG/KG | | U | | 1.4 | 1.4 | 4.7 | N | Yes | 5 | WET |
| | Lead | 7439-92-1 | T | MG/KG | 0.12 | | | 0.026 | 0.026 | 0.087 | Y | Yes | 1 | WET |
| | Lithium | 7439-93-2 | T | MG/KG | | U | | 0.10 | 0.10 | 0.50 | N | Yes | 5 | WET |
| | Molybdenum | 7439-98-7 | T | MG/KG | 0.038 | J | RL | 0.036 | 0.036 | 0.12 | Y | Yes | 1 | WET |
| | Nickel | 7440-02-0 | T | MG/KG | | U | | 0.21 | 0.21 | 0.68 | N | Yes | 5 | WET |
| | Selenium | 7782-49-2 | T | MG/KG | | U | | 0.25 | 0.25 | 0.84 | N | Yes | 5 | WET |
| | Silver | 7440-22-4 | T | MG/KG | | U | | 0.011 | 0.011 | 0.050 | N | Yes | 1 | WET |
| | Strontium | 7440-24-6 | T | MG/KG | 7.8 | | | 0.80 | 0.80 | 2.7 | Y | Yes | 5 | WET |
| | Thallium | 7440-28-0 | T | MG/KG | | U | | 0.013 | 0.013 | 0.10 | N | Yes | 1 | WET |
| | Vanadium | 7440-62-2 | T | MG/KG | | U | | 0.17 | 0.17 | 0.55 | N | Yes | 5 | WET |
| | Zinc | 7440-66-6 | T | MG/KG | 17.9 | J | RL | 8.6 | 8.6 | 28.7 | Y | Yes | 5 | WET |
| SW-846 7473 | Mercury | 7439-97-6 | T | MG/KG | | U* | BL | 0.019 | 0.019 | 0.019 | N | Yes | 1 | WET |

**TVA TDEC Program**
**Facility: Cumberland Fossil Plant**
**SDG: 40182299**

| | |
|---|---|
| **Lab Sample ID** | 40182299002 |
| **Sys Sample Code** | CUF-FH-SH-CURA-WF-20180410 |
| **Sample Name** | CUF-FH-SH-CURA-WF-20180410 |
| **Sample Date** | 4/10/2018 11:15:00 AM |
| **Location** | CURA |
| **Sample Type** | N |
| **Parent Sample** | |

| Analytic Method | Chemical Name | CAS Rn | Fraction | Result Unit | Final Result | Final Qual | Reason code | Final MDL | Final RL | Final QL | Final Detect | Final Report | DF | Basis |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| ASTM D2974-87 | Percent Moisture | MOISTURE | N | % | 80.0 | | | 0.10 | 0.10 | 0.10 | Y | Yes | 1 | WET |
| SW-846 6020A | Antimony | 7440-36-0 | T | MG/KG | | U | | 0.016 | 0.016 | 0.099 | N | Yes | 1 | WET |
| | Arsenic | 7440-38-2 | T | MG/KG | | U* | BE | 0.19 | 0.19 | 0.19 | N | Yes | 1 | WET |
| | Barium | 7440-39-3 | T | MG/KG | 2.2 | | | 0.030 | 0.030 | 0.10 | Y | Yes | 1 | WET |
| | Beryllium | 7440-41-7 | T | MG/KG | | U | | 0.033 | 0.033 | 0.11 | N | Yes | 1 | WET |
| | Boron | 7440-42-8 | T | MG/KG | | U | | 0.69 | 0.69 | 2.3 | N | Yes | 1 | WET |
| | Cadmium | 7440-43-9 | T | MG/KG | | U* | BE | 0.054 | 0.054 | 0.099 | N | Yes | 1 | WET |
| | Calcium | 7440-70-2 | T | MG/KG | 9640 | | | 25.1 | 25.1 | 83.7 | Y | Yes | 1 | WET |
| | Chromium | 7440-47-3 | T | MG/KG | 0.32 | J | L- | 0.087 | 0.087 | 0.29 | Y | Yes | 1 | WET |
| | Cobalt | 7440-48-4 | T | MG/KG | 0.12 | | | 0.0081 | 0.0081 | 0.099 | Y | Yes | 1 | WET |
| | Copper | 7440-50-8 | T | MG/KG | | U* | BE | 0.86 | 0.86 | 0.94 | N | Yes | 1 | WET |
| | Lead | 7439-92-1 | T | MG/KG | 0.13 | | | 0.026 | 0.026 | 0.086 | Y | Yes | 1 | WET |
| | Lithium | 7439-93-2 | T | MG/KG | 0.066 | J | RL | 0.021 | 0.021 | 0.099 | Y | Yes | 1 | WET |
| | Molybdenum | 7439-98-7 | T | MG/KG | 0.049 | J | RL | 0.035 | 0.035 | 0.12 | Y | Yes | 1 | WET |
| | Nickel | 7440-02-0 | T | MG/KG | 0.92 | | | 0.041 | 0.041 | 0.14 | Y | Yes | 1 | WET |
| | Selenium | 7782-49-2 | T | MG/KG | 0.39 | | | 0.050 | 0.050 | 0.17 | Y | Yes | 1 | WET |
| | Silver | 7440-22-4 | T | MG/KG | | U | | 0.011 | 0.011 | 0.049 | N | Yes | 1 | WET |
| | Strontium | 7440-24-6 | T | MG/KG | 5.6 | | | 0.16 | 0.16 | 0.53 | Y | Yes | 1 | WET |
| | Thallium | 7440-28-0 | T | MG/KG | | U* | BL | 0.018 | 0.018 | 0.099 | N | Yes | 1 | WET |
| | Vanadium | 7440-62-2 | T | MG/KG | 0.17 | | | 0.033 | 0.033 | 0.11 | Y | Yes | 1 | WET |
| | Zinc | 7440-66-6 | T | MG/KG | 18.3 | | | 1.7 | 1.7 | 5.7 | Y | Yes | 1 | WET |
| SW-846 7473 | Mercury | 7439-97-6 | T | MG/KG | | U* | BL | 0.015 | 0.015 | 0.019 | N | Yes | 1 | WET |

**TVA TDEC Program**
**Facility: Cumberland Fossil Plant**
**SDG: 40182299**

| | |
|---|---|
| **Lab Sample ID** | 40182299003 |
| **Sys Sample Code** | CUF-FH-SH-CURU-WF-20180417 |
| **Sample Name** | CUF-FH-SH-CURU-WF-20180417 |
| **Sample Date** | 4/17/2018 10:25:00 AM |
| **Location** | CURU |
| **Sample Type** | N |
| **Parent Sample** | |

| Analytic Method | Chemical Name | CAS Rn | Fraction | Result Unit | Final Result | Final Qual | Reason code | Final MDL | Final RL | Final QL | Final Detect | Final Report | DF | Basis |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| ASTM D2974-87 | Percent Moisture | MOISTURE | N | % | 77.2 | | | 0.10 | 0.10 | 0.10 | Y | Yes | 1 | WET |
| SW-846 6020A | Antimony | 7440-36-0 | T | MG/KG | | U | | 0.016 | 0.016 | 0.097 | N | Yes | 1 | WET |
| | Arsenic | 7440-38-2 | T | MG/KG | | U* | BE | 0.23 | 0.23 | 0.23 | N | Yes | 1 | WET |
| | Barium | 7440-39-3 | T | MG/KG | 3.8 | | | 0.030 | 0.030 | 0.099 | Y | Yes | 1 | WET |
| | Beryllium | 7440-41-7 | T | MG/KG | | U | | 0.032 | 0.032 | 0.11 | N | Yes | 1 | WET |
| | Boron | 7440-42-8 | T | MG/KG | | U | | 0.68 | 0.68 | 2.3 | N | Yes | 1 | WET |
| | Cadmium | 7440-43-9 | T | MG/KG | | U* | BE | 0.054 | 0.054 | 0.097 | N | Yes | 1 | WET |
| | Calcium | 7440-70-2 | T | MG/KG | 11300 | | | 24.8 | 24.8 | 82.5 | Y | Yes | 1 | WET |
| | Chromium | 7440-47-3 | T | MG/KG | 0.47 | J | L- | 0.086 | 0.086 | 0.29 | Y | Yes | 1 | WET |
| | Cobalt | 7440-48-4 | T | MG/KG | 0.21 | | | 0.0080 | 0.0080 | 0.097 | Y | Yes | 1 | WET |
| | Copper | 7440-50-8 | T | MG/KG | | U* | BE | 0.89 | 0.89 | 0.92 | N | Yes | 1 | WET |
| | Lead | 7439-92-1 | T | MG/KG | 0.32 | | | 0.026 | 0.026 | 0.085 | Y | Yes | 1 | WET |
| | Lithium | 7439-93-2 | T | MG/KG | 0.12 | | | 0.020 | 0.020 | 0.097 | Y | Yes | 1 | WET |
| | Molybdenum | 7439-98-7 | T | MG/KG | 0.047 | J | RL | 0.035 | 0.035 | 0.12 | Y | Yes | 1 | WET |
| | Nickel | 7440-02-0 | T | MG/KG | 0.32 | | | 0.040 | 0.040 | 0.13 | Y | Yes | 1 | WET |
| | Selenium | 7782-49-2 | T | MG/KG | 0.35 | | | 0.049 | 0.049 | 0.16 | Y | Yes | 1 | WET |
| | Silver | 7440-22-4 | T | MG/KG | | U | | 0.011 | 0.011 | 0.049 | N | Yes | 1 | WET |
| | Strontium | 7440-24-6 | T | MG/KG | 7.0 | | | 0.16 | 0.16 | 0.52 | Y | Yes | 1 | WET |
| | Thallium | 7440-28-0 | T | MG/KG | | U | | 0.013 | 0.013 | 0.097 | N | Yes | 1 | WET |
| | Vanadium | 7440-62-2 | T | MG/KG | 0.36 | | | 0.032 | 0.032 | 0.11 | Y | Yes | 1 | WET |
| | Zinc | 7440-66-6 | T | MG/KG | 17.1 | | | 1.7 | 1.7 | 5.6 | Y | Yes | 1 | WET |
| SW-846 7473 | Mercury | 7439-97-6 | T | MG/KG | | U* | BL | 0.014 | 0.014 | 0.019 | N | Yes | 1 | WET |

**TVA TDEC Program**
**Facility: Cumberland Fossil Plant**
**SDG: 40182299**

| | |
|---|---|
| **Lab Sample ID** | 40182299004 |
| **Sys Sample Code** | CUF-FH-SH-WCD-WF-20180410 |
| **Sample Name** | CUF-FH-SH-WCD-WF-20180410 |
| **Sample Date** | 4/10/2018 5:15:00 PM |
| **Location** | WCD |
| **Sample Type** | N |
| **Parent Sample** | |

| Analytic Method | Chemical Name | CAS Rn | Fraction | Result Unit | Final Result | Final Qual | Reason code | Final MDL | Final RL | Final QL | Final Detect | Final Report | DF | Basis |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| ASTM D2974-87 | Percent Moisture | MOISTURE | N | % | 79.2 | | | 0.10 | 0.10 | 0.10 | Y | Yes | 1 | WET |
| SW-846 6020A | Antimony | 7440-36-0 | T | MG/KG | | U | | 0.016 | 0.016 | 0.097 | N | Yes | 1 | WET |
| | Arsenic | 7440-38-2 | T | MG/KG | 0.31 | | | 0.029 | 0.029 | 0.097 | Y | Yes | 1 | WET |
| | Barium | 7440-39-3 | T | MG/KG | 5.7 | | | 0.030 | 0.030 | 0.098 | Y | Yes | 1 | WET |
| | Beryllium | 7440-41-7 | T | MG/KG | | U | | 0.032 | 0.032 | 0.11 | N | Yes | 1 | WET |
| | Boron | 7440-42-8 | T | MG/KG | | U | | 0.67 | 0.67 | 2.2 | N | Yes | 1 | WET |
| | Cadmium | 7440-43-9 | T | MG/KG | | U* | BE | 0.063 | 0.063 | 0.097 | N | Yes | 1 | WET |
| | Calcium | 7440-70-2 | T | MG/KG | 7810 | | | 24.5 | 24.5 | 81.7 | Y | Yes | 1 | WET |
| | Chromium | 7440-47-3 | T | MG/KG | 1.0 | J | L- | 0.085 | 0.085 | 0.28 | Y | Yes | 1 | WET |
| | Cobalt | 7440-48-4 | T | MG/KG | 0.44 | | | 0.0079 | 0.0079 | 0.097 | Y | Yes | 1 | WET |
| | Copper | 7440-50-8 | T | MG/KG | | U* | BE | 1.2 | 1.2 | 1.2 | N | Yes | 1 | WET |
| | Lead | 7439-92-1 | T | MG/KG | 0.49 | | | 0.025 | 0.025 | 0.084 | Y | Yes | 1 | WET |
| | Lithium | 7439-93-2 | T | MG/KG | 0.23 | | | 0.020 | 0.020 | 0.097 | Y | Yes | 1 | WET |
| | Molybdenum | 7439-98-7 | T | MG/KG | 0.060 | J | RL | 0.035 | 0.035 | 0.12 | Y | Yes | 1 | WET |
| | Nickel | 7440-02-0 | T | MG/KG | 0.92 | | | 0.040 | 0.040 | 0.13 | Y | Yes | 1 | WET |
| | Selenium | 7782-49-2 | T | MG/KG | 0.41 | | | 0.049 | 0.049 | 0.16 | Y | Yes | 1 | WET |
| | Silver | 7440-22-4 | T | MG/KG | | U | | 0.011 | 0.011 | 0.048 | N | Yes | 1 | WET |
| | Strontium | 7440-24-6 | T | MG/KG | 4.9 | | | 0.16 | 0.16 | 0.52 | Y | Yes | 1 | WET |
| | Thallium | 7440-28-0 | T | MG/KG | | U* | BL | 0.015 | 0.015 | 0.097 | N | Yes | 1 | WET |
| | Vanadium | 7440-62-2 | T | MG/KG | 0.85 | | | 0.032 | 0.032 | 0.11 | Y | Yes | 1 | WET |
| | Zinc | 7440-66-6 | T | MG/KG | 16.9 | | | 1.7 | 1.7 | 5.5 | Y | Yes | 1 | WET |
| SW-846 7473 | Mercury | 7439-97-6 | T | MG/KG | | U* | BL | 0.020 | 0.020 | 0.020 | N | Yes | 1 | WET |

**TVA TDEC Program**
**Facility: Cumberland Fossil Plant**
**SDG: 40182299**

| | |
|---|---|
| **Lab Sample ID** | 40182299005 |
| **Sys Sample Code** | CUF-FH-SH-WCU-WF-20180410 |
| **Sample Name** | CUF-FH-SH-WCU-WF-20180410 |
| **Sample Date** | 4/10/2018 3:30:00 PM |
| **Location** | WCU |
| **Sample Type** | N |
| **Parent Sample** | |

| Analytic Method | Chemical Name | CAS Rn | Fraction | Result Unit | Final Result | Final Qual | Reason code | Final MDL | Final RL | Final QL | Final Detect | Final Report | DF | Basis |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| ASTM D2974-87 | Percent Moisture | MOISTURE | N | % | 77.9 | | | 0.10 | 0.10 | 0.10 | Y | Yes | 1 | WET |
| SW-846 6020A | Antimony | 7440-36-0 | T | MG/KG | | U | | 0.016 | 0.016 | 0.097 | N | Yes | 1 | WET |
| | Arsenic | 7440-38-2 | T | MG/KG | 0.31 | | | 0.029 | 0.029 | 0.098 | Y | Yes | 1 | WET |
| | Barium | 7440-39-3 | T | MG/KG | 5.9 | | | 0.030 | 0.030 | 0.099 | Y | Yes | 1 | WET |
| | Beryllium | 7440-41-7 | T | MG/KG | | U | | 0.032 | 0.032 | 0.11 | N | Yes | 1 | WET |
| | Boron | 7440-42-8 | T | MG/KG | | U | | 0.68 | 0.68 | 2.3 | N | Yes | 1 | WET |
| | Cadmium | 7440-43-9 | T | MG/KG | | U* | BE | 0.067 | 0.067 | 0.097 | N | Yes | 1 | WET |
| | Calcium | 7440-70-2 | T | MG/KG | 14100 | | | 24.8 | 24.8 | 82.5 | Y | Yes | 1 | WET |
| | Chromium | 7440-47-3 | T | MG/KG | 1.0 | J | L- | 0.086 | 0.086 | 0.29 | Y | Yes | 1 | WET |
| | Cobalt | 7440-48-4 | T | MG/KG | 0.36 | | | 0.0080 | 0.0080 | 0.097 | Y | Yes | 1 | WET |
| | Copper | 7440-50-8 | T | MG/KG | | U* | BE | 1.2 | 1.2 | 1.2 | N | Yes | 1 | WET |
| | Lead | 7439-92-1 | T | MG/KG | 0.48 | | | 0.026 | 0.026 | 0.085 | Y | Yes | 1 | WET |
| | Lithium | 7439-93-2 | T | MG/KG | 0.17 | | | 0.020 | 0.020 | 0.097 | Y | Yes | 1 | WET |
| | Molybdenum | 7439-98-7 | T | MG/KG | 0.065 | J | RL | 0.035 | 0.035 | 0.12 | Y | Yes | 1 | WET |
| | Nickel | 7440-02-0 | T | MG/KG | 0.54 | | | 0.040 | 0.040 | 0.13 | Y | Yes | 1 | WET |
| | Selenium | 7782-49-2 | T | MG/KG | 0.51 | | | 0.049 | 0.049 | 0.16 | Y | Yes | 1 | WET |
| | Silver | 7440-22-4 | T | MG/KG | | U | | 0.011 | 0.011 | 0.049 | N | Yes | 1 | WET |
| | Strontium | 7440-24-6 | T | MG/KG | 8.5 | | | 0.16 | 0.16 | 0.52 | Y | Yes | 1 | WET |
| | Thallium | 7440-28-0 | T | MG/KG | | U | | 0.013 | 0.013 | 0.097 | N | Yes | 1 | WET |
| | Vanadium | 7440-62-2 | T | MG/KG | 0.76 | | | 0.032 | 0.032 | 0.11 | Y | Yes | 1 | WET |
| | Zinc | 7440-66-6 | T | MG/KG | 19.6 | | | 1.7 | 1.7 | 5.6 | Y | Yes | 1 | WET |
| SW-846 7473 | Mercury | 7439-97-6 | T | MG/KG | | U* | BL | 0.018 | 0.018 | 0.020 | N | Yes | 1 | WET |

# SECTION 3

# SUPPORTING DOCUMENTATION FOR QUALIFIERS

# A. WORK ORDER 40182296

ENVIRONMENTAL STANDARDS

# INORGANIC ANALYSIS SUPPORT DOCUMENTATION

| | | | |
|---|---|---|---|
| ESI project name: | TVA CUF EI | Reviewed by: | Danielle Coles |
| Sample Collection Dates: | 4/10/18, 5/1/18, 5/2/18, 5/8-5/10/18 | Approved by: | AP |
| Job Number: | 20188111.A000 | Completion Date: | 4/2019 |
| Project Manager: | AJC | | |
| Laboratory: | TestAmerica- Pittsburgh | | |

| | | | Applicable Sample No's ( X ) | Refer to Table 1 in the Quality Assurance Review |
|---|---|---|---|---|
| | | | Sample No. | Lab Control No. |
| Deliverable: | CLP (Full) | ( ) | | |
| | Level IV (Full) | ( X ) | 40182296 | |
| | Limited | ( ) | | |
| | Other: | | | |

The following table indicates criteria that were examined, the identified problems, and support documentation attachments

| | Criteria Examined in Detail<br>Check (√) if Yes or Footnote Letter for Comments Below | | | | | Problems Identified<br>Check (√) if Yes or Footnote Letter for Comments Below | | | | | Support Documentation Attachments<br>Check (√) if Yes or Footnote Letter for Comments Below | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | 6020A | 7473 | ASTM D2974-87 | | | 6020A | 7473 | ASTM D2974-87 | | | 6020A | 7473 | ASTM D2974-87 | | |
| Holding Times | X | X | X | | | | | | | | | | | | |
| Blank Analysis Results | X | X | | | | X | | | | | X | | | | |
| Matrix Spike (Predigestion) Results | X | X | | | | | | | | | | | | | |
| Duplicate Analysis: ( ) Field ( X ) Lab | | | X | | | | | | | | | | | | |
| Quantitation of Results | X | X | | | | | | | | | | | | | |
| Detection Limit/Sensitivity | | | | | | | | | | | | | | | |
| Initial Calibrations | X | X | | | | | X | | | | | X | | | |
| Continuing Calibrations | X | X | | | | | | | | | | | | | |
| Laboratory Control Standard (LCS) | X | X | | | | X | | | | | X | | | | |
| ICP Linear Range Analysis | X | | | | | | | | | | | | | | |
| ICP Interference Checks | | | | | | | | | | | | | | | |
| ICP Serial Dilutions | X | | | | | | | | | | | | | | |
| ICP Post-Digestion Spike | X | | | | | | | | | | | | | | |
| GFAA Post Digestion Spikes | | | | | | | | | | | | | | | |
| GFAA Duplicate Injections | | | | | | | | | | | | | | | |
| ICP Multiple Exposures | X | | | | | | | | | | | | | | |
| GFAA Standard Additions | | | | | | | | | | | | | | | |
| CRDL Standards | X | X | | | | | | | | | | | | | |
| Condition on Receipt | X | X | | | | | | | | | | | | | |
| Percent Solids | X | X | | | | | | | | | | | | | |
| Others: ICPMS internal standards | X | | | | | | | | | | | | | | |

Comments: All results are acceptable unless otherwise qualified.

ENVIRONMENTAL STANDARDS

# BLANK ANALYSIS RESULTS FOR INORGANIC PARAMETERS

| | Blank Type | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | Method | | | | | | | | | |
| Matrix (Aq., S.) | ICB | CCB | Prep. | Trip | Equip | Field | Blank Sample Number | Contaminant | Concentration (µg/L, mg/L, mg/kg) | Qualification limit (5×) |
| Aq | | X | | | | | CCB 1/31/19 20:24 | molybdenum | 0.23 | 1.15 |
| | | | | | | | | silver | 0.031 | 0.155 |
| | | | | | | | | | | |
| Aq | X | | | | | | ICB 2/18/19 | mercury | 0.0114 | 0.057 |
| Aq | | | X | | | | method blank | mercury | 0.044 | 0.22 |
| | | | | | | | | | | |
| Aq | | | | | X | | CUF-FH-LB-F-EB01-20180412 | arsenic | 0.567 | 2.835 |
| | | | | | | | | cadmium | 0.495 | 2.475 |
| | | | | | | | | copper | 5.213 | 26.065 |
| | | | | | | | CUF-FH-LB-F-EB01-20180510 | barium | 1.866 | 9.33 |

Aq = Aqueous; S = Solid

Notes:

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Green Bay, WI 54302
(920)469-2436

## ANALYTICAL RESULTS

Project: CUF FISH TISSUE EQUIP. BLANKS
Pace Project No.: 40168712

**Sample: CUF-FH-LB-F-EB01-20180412** **Lab ID: 40168712001** Collected: 04/12/18 08:00 Received: 05/08/18 09:45 Matrix: Tissue

***Results reported on a "wet-weight" basis***

| Parameters | Results | Units | PQL | MDL | DF | Prepared | Analyzed | CAS No. | Qual |
|---|---|---|---|---|---|---|---|---|---|
| **6020 MET ICPMS** | Analytical Method: EPA 6020 Preparation Method: EPA 3050B | | | | | | | | |
| Antimony | x5 <0.011 | mg/kg | 0.090 | 0.011 | 1 | 06/29/18 09:03 | 07/05/18 17:31 | 7440-36-0 | |
| Arsenic | 0.255 0.051J | mg/kg | 0.090 | 0.027 | 1 | 06/29/18 09:03 | 07/05/18 17:31 | 7440-38-2 | |
| Barium | <0.041 | mg/kg | 0.14 | 0.041 | 1 | 06/29/18 09:03 | 07/05/18 17:31 | 7440-39-3 | |
| Beryllium | <0.030 | mg/kg | 0.099 | 0.030 | 1 | 06/29/18 09:03 | 07/09/18 21:06 | 7440-41-7 | |
| Boron | <0.27 | mg/kg | 0.91 | 0.27 | 1 | 06/29/18 09:03 | 07/09/18 21:06 | 7440-42-8 | |
| Cadmium | .225 0.045J | mg/kg | 0.090 | 0.0090 | 1 | 06/29/18 09:03 | 07/05/18 17:31 | 7440-43-9 | |
| Calcium | <22.9 | mg/kg | 76.2 | 22.9 | 1 | 06/29/18 09:03 | 07/05/18 17:31 | 7440-70-2 | |
| Chromium | <0.080 | mg/kg | 0.27 | 0.080 | 1 | 06/29/18 09:03 | 07/05/18 17:31 | 7440-47-3 | |
| Cobalt | <0.0074 | mg/kg | 0.090 | 0.0074 | 1 | 06/29/18 09:03 | 07/05/18 17:31 | 7440-48-4 | |
| Copper | 2.35 0.47 | mg/kg | 0.37 | 0.11 | 1 | 06/29/18 09:03 | 07/05/18 17:31 | 7440-50-8 | |
| Lead | <0.011 | mg/kg | 0.090 | 0.011 | 1 | 06/29/18 09:03 | 07/05/18 17:31 | 7439-92-1 | |
| Lithium | <0.014 | mg/kg | 0.090 | 0.014 | 1 | 06/29/18 09:03 | 07/09/18 21:06 | 7439-93-2 | |
| Molybdenum | <0.032 | mg/kg | 0.11 | 0.032 | 1 | 06/29/18 09:03 | 07/06/18 18:11 | 7439-98-7 | |
| Nickel | <0.037 | mg/kg | 0.12 | 0.037 | 1 | 06/29/18 09:03 | 07/05/18 17:31 | 7440-02-0 | |
| Selenium | <0.046 | mg/kg | 0.15 | 0.046 | 1 | 06/29/18 09:03 | 07/05/18 17:31 | 7782-49-2 | |
| Silver | <0.016 | mg/kg | 0.054 | 0.016 | 1 | 06/29/18 09:03 | 07/05/18 17:31 | 7440-22-4 | |
| Strontium | <0.14 | mg/kg | 0.48 | 0.14 | 1 | 06/29/18 09:03 | 07/05/18 17:31 | 7440-24-6 | |
| Thallium | <0.012 | mg/kg | 0.090 | 0.012 | 1 | 06/29/18 09:03 | 07/06/18 18:11 | 7440-28-0 | |
| Vanadium | <0.030 | mg/kg | 0.10 | 0.030 | 1 | 06/29/18 09:03 | 07/05/18 17:31 | 7440-62-2 | |
| Zinc | <1.6 | mg/kg | 5.2 | 1.6 | 1 | 06/29/18 09:03 | 07/05/18 17:31 | 7440-66-6 | |
| **7473 Mercury, Tissue** | Analytical Method: EPA 7473 | | | | | | | | |
| Mercury | <0.0031 | mg/kg | 0.020 | 0.0031 | 1 | | 06/07/18 09:53 | 7439-97-6 | H3 |

See below for qualifiers

raw data results

arsenic 0.567 x5 = 2.835 U: 11, 12, 13, 14, 15, 16, 17, 18, 19, 20
cadmium 0.495 x5 = 2.475 results ND, no qual
copper 5.213 x5 = 26.07 U: 4, 6, 7, 8, 9, 10, 14, 18



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# ANALYTICAL RESULTS

Project: CUMBERLAND INTERIM ENVIRONMENT
Pace Project No.: 40170416

**Sample: CUF-FH-LB-F-EB01-20180510** **Lab ID: 40170416001** Collected: 05/10/18 12:00 Received: 06/07/18 10:05 Matrix: Tissue

***Results reported on a "wet-weight" basis***

| Parameters | Results | Units | PQL | MDL | DF | Prepared | Analyzed | CAS No. | Qual |
|---|---|---|---|---|---|---|---|---|---|
| **6020 MET ICPMS** | Analytical Method: EPA 6020 Preparation Method: EPA 3050B | | | | | | | | |
| Antimony | x5 **<0.011** | mg/kg | 0.091 | 0.011 | 1 | 06/29/18 09:03 | 07/05/18 18:13 | 7440-36-0 | |
| Arsenic | **<0.027** | mg/kg | 0.091 | 0.027 | 1 | 06/29/18 09:03 | 07/05/18 18:13 | 7440-38-2 | |
| Barium See below for qualifiers | 0.85 **0.17** | mg/kg | 0.14 | 0.041 | 1 | 06/29/18 09:03 | 07/05/18 18:13 | 7440-39-3 | |
| Beryllium | **<0.030** | mg/kg | 0.10 | 0.030 | 1 | 06/29/18 09:03 | 07/09/18 21:34 | 7440-41-7 | |
| Boron | **<0.28** | mg/kg | 0.92 | 0.28 | 1 | 06/29/18 09:03 | 07/09/18 21:34 | 7440-42-8 | |
| Cadmium | **<0.0091** | mg/kg | 0.091 | 0.0091 | 1 | 06/29/18 09:03 | 07/05/18 18:13 | 7440-43-9 | |
| Calcium | **<23.1** | mg/kg | 76.8 | 23.1 | 1 | 06/29/18 09:03 | 07/05/18 18:13 | 7440-70-2 | |
| Chromium | **<0.080** | mg/kg | 0.27 | 0.080 | 1 | 06/29/18 09:03 | 07/05/18 18:13 | 7440-47-3 | |
| Cobalt | **<0.0074** | mg/kg | 0.091 | 0.0074 | 1 | 06/29/18 09:03 | 07/05/18 18:13 | 7440-48-4 | |
| Copper | **<0.11** | mg/kg | 0.37 | 0.11 | 1 | 06/29/18 09:03 | 07/05/18 18:13 | 7440-50-8 | |
| Lead | **<0.011** | mg/kg | 0.091 | 0.011 | 1 | 06/29/18 09:03 | 07/05/18 18:13 | 7439-92-1 | |
| Lithium | **<0.014** | mg/kg | 0.091 | 0.014 | 1 | 06/29/18 09:03 | 07/09/18 21:34 | 7439-93-2 | |
| Molybdenum | **<0.032** | mg/kg | 0.11 | 0.032 | 1 | 06/29/18 09:03 | 07/06/18 18:54 | 7439-98-7 | |
| Nickel | **<0.037** | mg/kg | 0.12 | 0.037 | 1 | 06/29/18 09:03 | 07/05/18 18:13 | 7440-02-0 | |
| Selenium | **<0.046** | mg/kg | 0.15 | 0.046 | 1 | 06/29/18 09:03 | 07/05/18 18:13 | 7782-49-2 | |
| Silver | **<0.016** | mg/kg | 0.054 | 0.016 | 1 | 06/29/18 09:03 | 07/05/18 18:13 | 7440-22-4 | |
| Strontium | **<0.15** | mg/kg | 0.49 | 0.15 | 1 | 06/29/18 09:03 | 07/05/18 18:13 | 7440-24-6 | |
| Thallium | **<0.012** | mg/kg | 0.091 | 0.012 | 1 | 06/29/18 09:03 | 07/06/18 18:54 | 7440-28-0 | |
| Vanadium | **<0.030** | mg/kg | 0.10 | 0.030 | 1 | 06/29/18 09:03 | 07/05/18 18:13 | 7440-62-2 | |
| Zinc | **<1.6** | mg/kg | 5.2 | 1.6 | 1 | 06/29/18 09:03 | 07/05/18 18:13 | 7440-66-6 | |
| **7473 Mercury, Tissue** | Analytical Method: EPA 7473 | | | | | | | | |
| Mercury | **<0.0031** | mg/kg | 0.020 | 0.0031 | 1 | | 06/20/18 07:52 | 7439-97-6 | H3 |

raw data result

barium 1.866 x5 = 9.33 mg/L U*, BE: 1,2,4,5,14,19,20

## REPORT OF LABORATORY ANALYSIS

This report shall not be reproduced, except in full,
without the written consent of Pace Analytical Services, LLC.

FORM II INORGANIC-1
CRDL CHECK STANDARD

Lab Name: Pace Analytical - Green Bay SDG No. : 40182296 Contract: 0777010 CUMBERLAND FOSSIL PLAN

CRDL Check Standard Source: 216909 Analysis Date/Time: 01/31/2019 15:53 ✓

Concentration Units: ug/L

70-130%

| Analyte | CRDL Check Standard | | | |
|---|---|---|---|---|
| | True | Found | %R | Control Limit %R |
| Boron | 5.0 | 5.3 ✓ | 105.4 | 70-130 |
| Calcium | ~~250~~ 500 | 502 | ~~200.8~~ 100.4 | 70-130 |
| Copper | ~~1.0~~ 5.0 | 5.2 | ~~521.6~~ 104.3 | 70-130 |
| Strontium | ~~1.0~~ 5.0 | 5.3 ✓ | ~~529.5~~ 105.9 | 70-130 |
| Zinc | 5.0 DC 3/19/19 | 5.9 | 119.0 ✓ DC 3/19/19 | 70-130 |

* Issue indicated in the Case narrative

FORM II INORGANIC-1

CRDL CHECK STANDARD

Lab Name: Pace Analytical - Green Bay SDG No. : 40182296 Contract: 0777010 CUMBERLAND FOSSIL PLAN

CRDL Check Standard Source: 216909 Analysis Date/Time: 01/31/2019 18:18 ✓

Concentration Units: ug/L

70-130%

| Analyte | CRDL Check Standard | | | |
|---|---|---|---|---|
| | True | Found | %R | Control Limit %R |
| Boron | 5.0 | 5.3 | 105.9 ✓ | 70-130 |
| Calcium | ~~250~~ 500 | 490 ✓ | ~~196~~.2 98.1 | 70-130 |
| Copper | ~~1.0~~ 5.0 | 5.3 | ~~529~~.7 105.9 | 70-130 |
| Strontium | ~~1.0~~ 5.0 | 5.3 | ~~503~~.2 106.6 | 70-130 |
| Zinc | 5.0 DC3/19/19 | 5.7 ✓ | 113.2 DC 3/19/19 ✓ | 70-130 |

* issue indicated in the case narrative

FORM II INORGANIC-1
CRDL CHECK STANDARD

Lab Name: Pace Analytical - Green Bay SDG No. : 40182296 Contract: 0777010 CUMBERLAND FOSSIL PLAN

CRDL Check Standard Source: 216909 Analysis Date/Time: 01/31/2019 19:56 ✓

Concentration Units: ug/L

70-130%

| Analyte | CRDL Check Standard | | | |
|---|---|---|---|---|
| | True | Found | %R | Control Limit %R |
| Boron | 5.0 | 5.5 | 109.8 ✓ | 70-130 |
| Calcium | ~~250~~ 500 | 516 ✓ | ~~206.2~~ 103.1 | 70-130 |
| Copper | ~~1.0~~ 5.0 | 5.5 | ~~545.8~~ 109.2 | 70-130 |
| Strontium | ~~1.0~~ 5.0 | 5.3 | ~~532.6~~ 106.5 | 70-130 |
| Zinc | 5.0 DL 3/19/19 | 5.9 ✓ | 117.3 ✓ DL 3/19/19 | 70-130 |

* issue indicated in the case narrative

FORM II INORGANIC-1
CRDL CHECK STANDARD

Lab Name: Pace Analytical - Green Bay SDG No. : 40182296 Contract: 0777010 CUMBERLAND FOSSIL PLAN

CRDL Check Standard Source: 216909 Analysis Date/Time: 01/31/2019 23:09 ✓

Concentration Units: ug/L

70-130%

| Analyte | CRDL Check Standard | | | |
|---|---|---|---|---|
| | True | Found | %R | Control Limit %R |
| Boron | 5.0 | 4.6 | 92.7 | 70-130 |
| Calcium | ~~250~~ 500 | 538 ✓ | ~~215.4~~ 107.7 | 70-130 |
| Copper | ~~1.0~~ 5.0 | 5.3 | ~~533.7~~ 106.7 | 70-130 |
| Strontium | ~~1.0~~ 5.0 | 5.4 | ~~537~~.3 107.6 | 70-130 |
| Zinc | 5.0 DC 3/19/19 | 5.2 ✓ | 103.7 ✓ DC 3/19/19 | 70-130 |

* Issue indicated in the case narrative

SAMPLE NO.

182138 1SRM

FORM VII INORGANIC-1
LABORATORY CONTROL SAMPLE

Lab Name: Pace Analytical - Green Bay SDG No. : 40182296 Contract: 0777010 CUMBERLAND

Matrix: Tissue

80-120 %

| Analyte | Units | True | Found | %R | Limits | |
|---|---|---|---|---|---|---|
| Arsenic | mg/kg | 59.5 | 69.1 ✓ | 116 | 80 | 126 |
| Cadmium | mg/kg | 42.3 | 39.8 | 94 | 80 | 120 |
| Chromium | mg/kg | 2.0 | 0.85 | 44 ↓ | 13 | 93 |
| Cobalt | mg/kg | 1.1 | 1.0 | 97 | 80 | 120 |
| Copper | mg/kg | 497 | 442 | 89 | 77 | 120 |
| Lead | mg/kg | 0.22 | 0.21 | 94 | 79 | 120 |
| Molybdenum | mg/kg | 3.4 | 3.1 ✓ | 89 ✓ | 80 | 120 |
| Nickel | mg/kg | 5.3 | 4.3 | 80 | 76 | 120 |
| Selenium | mg/kg | 10.9 | 12.6 | 116 | 80 | 130 |
| Strontium | mg/kg | 36.5 | 30.5 | 84 | 79 | 120 |
| Vanadium | mg/kg | 9.1 | 9.1 | 100 | 80 | 120 |
| Zinc | mg/kg | 136 | 132 | 97 ✓ | 80 | 120 |

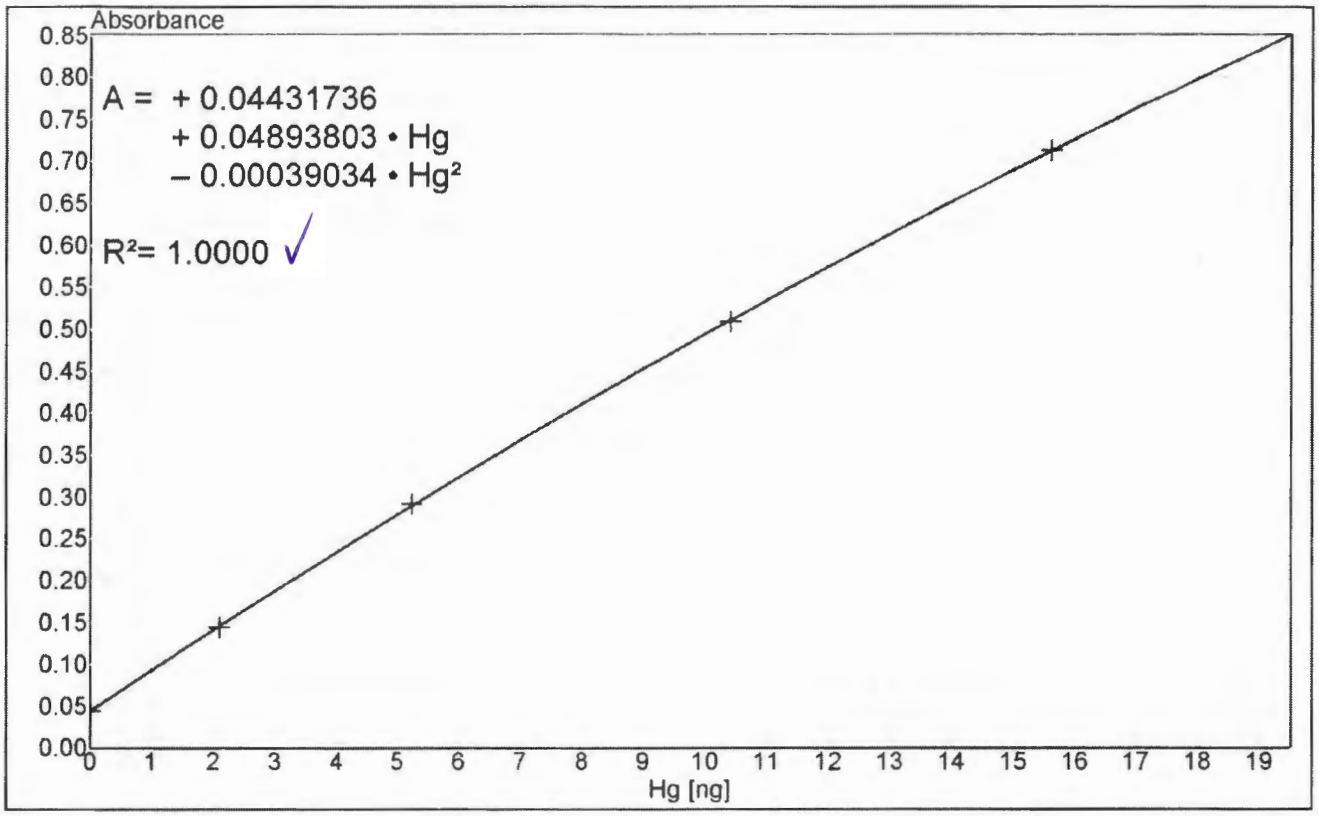
UJ, L-: all samples (1-20)

# Calibration data "02112019CAL.c80"

Created by "Administrator" at
11.02.2019 12:56:17



Cell 1




| Nr. | | Hg [ng] | Height ^ | Error ⊿E [%] | Date | Remarks |
|---|---|---|---|---|---|---|
| 1 | ✔ | 0.0000 | 0.0444 | 0.0001 | 11.02.2019 10:33:05 | |
| 2 | ✔ | 2.0880 | 0.1435 | -0.0013 | 11.02.2019 10:45:28 | |
| 3 | ✔ | 5.2200 | 0.2916 | 0.0025 | 11.02.2019 10:58:27 | |
| 4 | ✔ | 10.4000 | 0.5093 | -0.0018 | 11.02.2019 11:10:17 | |
| 5 | ✔ | 15.6000 | 0.7133 | 0.0005 | 11.02.2019 11:22:09 | |

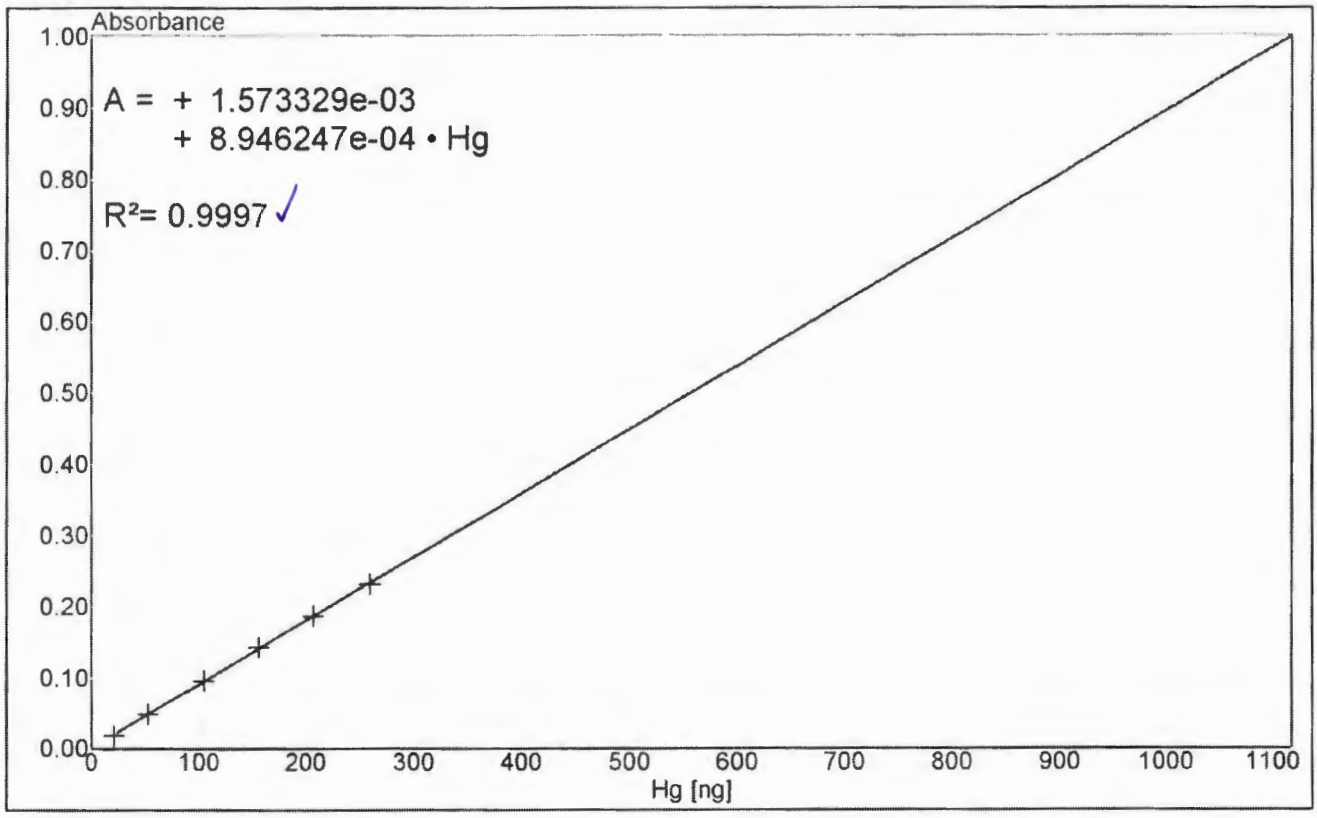
0–15.6 ng

# Calibration data "02112019CAL.c80"

Created by "Administrator" at
11.02.2019 12:56:17



Cell 2




| Nr. | | Hg [ng] | Height ^ | Error ΔE [%] | Date | Remarks |
|---|---|---|---|---|---|---|
| 1 | ✔ | 20.7200 | 0.0186 | -0.0015 | 11.02.2019 11:35:09 | |
| 2 | ✔ | 52.2000 | 0.0484 | 0.0001 | 11.02.2019 11:47:52 | |
| 3 | ✔ | 104.0000 | 0.0953 | 0.0007 | 11.02.2019 12:00:51 | |
| 4 | ✔ | 155.4000 | 0.1426 | 0.0020 | 11.02.2019 12:19:31 | |
| 5 | ✔ | 206.4000 | 0.1866 | 0.0004 | 11.02.2019 12:35:08 | |
| 6 | ✔ | 259.0000 | 0.2316 | -0.0017 | 11.02.2019 12:49:49 | |

20.72 - 259 ng

# Sample listing "02182019B_40HG4_AJD.d80"



Created by "Administrator"
19.02.2019 06:31:50

| Pos Nr | Samplename Remark | Amount Date | State Date | Height | Hg [ng] | Concentr. [mg/kg] | Σ | Cal-Factor | Calibration file Date | Method file Date |
|---|---|---|---|---|---|---|---|---|---|---|
| - 22 | auto BV (1) | 0.0000 g 18.02.19 13:12 | ✓ B 18.02.19 13:11 | 0.0008 | 0.0000 | | | 1.0000 | 02112019CAL.c80 11.02.19 12:56 | |
| 13 23 | CCB 218116_11363 <0.02 | 0.1000 g 18.02.19 11:08 | ✓ 18.02.19 13:15 | 0.0027 | 0.0000 | 0.0000 | | 1.0000 | 02112019CAL.c80 11.02.19 12:56 | 7473 Biota.m80 31.10.11 13:06 |
| 14 24 | 40182296006_11362 B | 0.1088 g 18.02.19 11:09 | ✓ 18.02.19 13:26 | 0.4770 | 9.5723 | 0.0880 | | 1.0000 | 02112019CAL.c80 11.02.19 12:56 | 7473 Biota.m80 31.10.11 13:06 |
| 15 25 | 40182296007_11362 B E (1) | 0.1037 g 18.02.19 11:10 | ✓ 18.02.19 13:37 | 0.8275 | 18.8322 J,C | 0.1816 | | 1.0000 | 02112019CAL.c80 11.02.19 12:56 | 7473 Biota.m80 31.10.11 13:06 |
| 16 26 | 40182296008_11362 B (1) | 0.1070 g 18.02.19 11:11 | ✓ 18.02.19 13:49 | 0.5897 | 12.3636 | 0.1155 | | 1.0000 | 02112019CAL.c80 11.02.19 12:56 | 7473 Biota.m80 31.10.11 13:06 |
| 17 27 | 40182296009_11362 B E (1) | 0.1059 g 18.02.19 11:12 | ✓ 18.02.19 14:00 | 0.7459 | 16.5095 J,C | 0.1559 | | 1.0000 | 02112019CAL.c80 11.02.19 12:56 | 7473 Biota.m80 31.10.11 13:06 |
| 18 28 | 40182296010_11362 B E (1) | 0.1006 g 18.02.19 11:13 | ✓ 18.02.19 14:12 | 0.7857 | 17.6270 | 0.1752 | | 1.0000 | 02112019CAL.c80 11.02.19 12:56 | 7473 Biota.m80 31.10.11 13:06 |
| 19 29 | 40182296011_11362 B (1) | 0.1063 g 18.02.19 11:13 | ✓ 18.02.19 14:23 | 0.0245 | 25.6271 | 0.2411 | | 1.0000 | 02112019CAL.c80 11.02.19 12:56 | 7473 Biota.m80 31.10.11 13:06 |
| 20 30 | 40182296012_11362 B (1) | 0.1081 g 18.02.19 11:14 | ✓ 18.02.19 14:35 | 0.0261 | 27.4156 | 0.2536 | | 1.0000 | 02112019CAL.c80 11.02.19 12:56 | 7473 Biota.m80 31.10.11 13:06 |
| 21 31 | 40182296013_11362 B (1) | 0.1045 g 18.02.19 11:15 | ✓ 18.02.19 14:46 | 0.0270 | 28.4216 | 0.2720 | | 1.0000 | 02112019CAL.c80 11.02.19 12:56 | 7473 Biota.m80 31.10.11 13:06 |
| 22 32 | 40182296014_11362 B (1) | 0.1052 g 18.02.19 11:16 | ✓ 18.02.19 14:58 | 0.0242 | 25.2918 | 0.2404 | | 1.0000 | 02112019CAL.c80 11.02.19 12:56 | 7473 Biota.m80 31.10.11 13:06 |
| 23 33 | 40182296015_11362 B (1) | 0.1095 g 18.02.19 11:17 | ✓ 18.02.19 15:09 | 0.0325 | 34.5694 | 0.3157 | | 1.0000 | 02112019CAL.c80 11.02.19 12:56 | 7473 Biota.m80 31.10.11 13:06 |
| 24 34 | CCVB 211955_11363 105% | 0.0273 g 18.02.19 11:18 | ✓ 18.02.19 15:21 | 0.4253 | 8.3398 | 0.3055 | | 1.0000 | 02112019CAL.c80 11.02.19 12:56 | 7473 Biota.m80 31.10.11 13:06 |
| 25 35 | CCVA 146935_11363 109% | 0.0271 g 18.02.19 11:21 | ✓ 18.02.19 15:32 | 0.1127 | 124.2160 | 4.5836 | | 1.0000 | 02112019CAL.c80 11.02.19 12:56 | 7473 Biota.m80 31.10.11 13:06 |
| 36 | auto BV (1) | 0.0000 g 18.02.19 15:45 | ✓ B 18.02.19 15:44 | 0.0005 | 0.0000 | | | 1.0000 | 02112019CAL.c80 11.02.19 12:56 | |
| 26 37 | CCB 218116_11363 <0.02 | 0.1000 g 18.02.19 11:22 | ✓ 18.02.19 15:47 | 0.0023 | 0.0000 | 0.0000 | | 1.0000 | 02112019CAL.c80 11.02.19 12:56 | 7473 Biota.m80 31.10.11 13:06 |
| 27 38 | 40182296016_11362 B | 0.1003 g 18.02.19 11:22 | ✓ 18.02.19 15:58 | 0.4305 | 8.4625 | 0.0844 | | 1.0000 | 02112019CAL.c80 11.02.19 12:56 | 7473 Biota.m80 31.10.11 13:06 |
| 28 39 | 40182296017_11362 B (1) | 0.1072 g 18.02.19 11:23 | ✓ 18.02.19 16:10 | 0.6776 | 14.6522 | 0.1367 | | 1.0000 | 02112019CAL.c80 11.02.19 12:56 | 7473 Biota.m80 31.10.11 13:06 |
| 29 40 | 40182296018_11362 B (1) | 0.1023 g 18.02.19 11:24 | ✓ 18.02.19 16:21 | 0.5474 | 11.2982 | 0.1104 | | 1.0000 | 02112019CAL.c80 11.02.19 12:56 | 7473 Biota.m80 31.10.11 13:06 |
| 30 41 | 40182296019_11362 B (1) | 0.1046 g 18.02.19 11:25 | ✓ 18.02.19 16:33 | 0.6061 | 12.7828 | 0.1222 | | 1.0000 | 02112019CAL.c80 11.02.19 12:56 | 7473 Biota.m80 31.10.11 13:06 |
| 31 42 | 40182296020_11362 B E (1) | 0.1019 g 18.02.19 11:26 | ✓ 18.02.19 16:44 | 0.7483 | 16.5759 J,C | 0.1627 | | 1.0000 | 02112019CAL.c80 11.02.19 12:56 | 7473 Biota.m80 31.10.11 13:06 |

## B. WORK ORDER 40182297

ENVIRONMENTAL STANDARDS

# INORGANIC ANALYSIS SUPPORT DOCUMENTATION

| | | | |
|---|---|---|---|
| ESI project name: | TVA CUF EI | Reviewed by: | Danielle Coles |
| Sample Collection Dates: | 4/10/18, 5/1/18, 5/2/18, 5/8-5/10/18 | Approved by: | AP |
| Job Number: | 20188111.A000 | Completion Date: | 4/2019 |
| Project Manager: | AJC | | |
| Laboratory: | TestAmerica- Pittsburgh | | |

Applicable Sample No's ( X ) — Refer to Table 1 in the Quality Assurance Review

| Deliverable: | | | Sample No. | Lab Control No. |
|---|---|---|---|---|
| | CLP (Full) | ( ) | | |
| | Level IV (Full) | ( X ) | 40182297 | |
| | Limited | ( ) | | |
| | Other: | | | |

The following table indicates criteria that were examined, the identified problems, and support documentation attachments

| | Criteria Examined in Detail<br>Check (√) if Yes or Footnote Letter for Comments Below | | | | | Problems Identified<br>Check (√) if Yes or Footnote Letter for Comments Below | | | | | Support Documentation Attachments<br>Check (√) if Yes or Footnote Letter for Comments Below | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | 6020A | 7473 | ASTM D2974-87 | | | 6020A | 7473 | ASTM D2974-87 | | | 6020A | 7473 | ASTM D2974-87 | | |
| Holding Times | X | X | X | | | | | | | | | | | | |
| Blank Analysis Results | X | X | | | | X | X | | | | X | X | | | |
| Matrix Spike (Predigestion) Results | X | X | | | | | | | | | | | | | |
| Duplicate Analysis: ( ) Field ( X ) Lab | | | X | | | | | | | | | | | | |
| Quantitation of Results | X | X | | | | | | | | | | | | | |
| Detection Limit/Sensitivity | | | | | | | | | | | | | | | |
| Initial Calibrations | X | X | | | | | | | | | | | | | |
| Continuing Calibrations | X | X | | | | | | | | | | | | | |
| Laboratory Control Standard (LCS) | X | X | | | | | | | | | | | | | |
| ICP Linear Range Analysis | X | | | | | | | | | | | | | | |
| ICP Interference Checks | | | | | | | | | | | | | | | |
| ICP Serial Dilutions | X | | | | | | | | | | | | | | |
| ICP Post-Digestion Spike | X | | | | | | | | | | | | | | |
| GFAA Post Digestion Spikes | | | | | | | | | | | | | | | |
| GFAA Duplicate Injections | | | | | | | | | | | | | | | |
| ICP Multiple Exposures | X | | | | | | | | | | | | | | |
| GFAA Standard Additions | | | | | | | | | | | | | | | |
| CRDL Standards | X | X | | | | | | | | | | | | | |
| Condition on Receipt | X | X | | | | | | | | | | | | | |
| Percent Solids | X | X | | | | | | | | | | | | | |
| Others: ICPMS internal standards | X | | | | | | | | | | | | | | |

Comments: All results are acceptable unless otherwise qualified.

ENVIRONMENTAL STANDARDS

# BLANK ANALYSIS RESULTS FOR INORGANIC PARAMETERS

| | Blank Type | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | Method | | | | | | | | | |
| Matrix (Aq., S.) | ICB | CCB | Prep. | Trip | Equip | Field | Blank Sample Number | Contaminant | Concentration (µg/L, mg/L, mg/kg) | Qualification limit (5×) |
| Aq | X | X | | | | | ICB/CCB 2/5/19 ICM3 | antimony | 0.23 | 1.15 |
| | | | | | | | | arsenic | 0.3 | 1.5 |
| | | | | | | | | cadmium | 0.26 | 1.3 |
| | | | | | | | | cobalt | 0.29 | 1.45 |
| | | | | | | | | silver | 0.15 | 0.75 |
| | | | | | | | | vanadium | 0.34 | 1.7 |
| | | | | | | | | molydenum | 0.89 | 4.45 |
| | | | | | | | | | | |
| Aq | X | | | | | | ICB 2/25/19 | mercury | 0.0058 | 0.029 |
| | | | | | | | | | | |
| Aq | | | | | X | | CUF-FH-LB F-EB01 20180412 | arsenic | 0.567 | 2.835 |
| | | | | | | | | cadmium | 0.495 | 2.475 |
| | | | | | | | | copper | 5.213 | 26.065 |
| | | | | | | | CUF-FH-LB-F EB01 20180510 | barium | 1.866 | 9.33 |

Aq = Aqueous; S = Solid

Notes:

Pace Analytical®
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Green Bay, WI 54302
(920)469-2436

# ANALYTICAL RESULTS

Project: CUMBERLAND INTERIM ENVIRONMENT
Pace Project No.: 40170416

**Sample: CUF-FH-LB-F-EB01-20180510** **Lab ID: 40170416001** Collected: 05/10/18 12:00 Received: 06/07/18 10:05 Matrix: Tissue

***Results reported on a "wet-weight" basis***

| Parameters | | Results | Units | PQL | MDL | DF | Prepared | Analyzed | CAS No. | Qual |
|---|---|---|---|---|---|---|---|---|---|---|
| **6020 MET ICPMS** | | Analytical Method: EPA 6020 Preparation Method: EPA 3050B | | | | | | | | |
| Antimony | | 15 <0.011 | mg/kg | 0.091 | 0.011 | 1 | 06/29/18 09:03 | 07/05/18 18:13 | 7440-36-0 | |
| Arsenic | | <0.027 | mg/kg | 0.091 | 0.027 | 1 | 06/29/18 09:03 | 07/05/18 18:13 | 7440-38-2 | |
| Barium | See below for qualifiers | 0.85 0.17 | mg/kg | 0.14 | 0.041 | 1 | 06/29/18 09:03 | 07/05/18 18:13 | 7440-39-3 | |
| Beryllium | | <0.030 | mg/kg | 0.10 | 0.030 | 1 | 06/29/18 09:03 | 07/09/18 21:34 | 7440-41-7 | |
| Boron | | <0.28 | mg/kg | 0.92 | 0.28 | 1 | 06/29/18 09:03 | 07/09/18 21:34 | 7440-42-8 | |
| Cadmium | | <0.0091 | mg/kg | 0.091 | 0.0091 | 1 | 06/29/18 09:03 | 07/05/18 18:13 | 7440-43-9 | |
| Calcium | | <23.1 | mg/kg | 76.8 | 23.1 | 1 | 06/29/18 09:03 | 07/05/18 18:13 | 7440-70-2 | |
| Chromium | | <0.080 | mg/kg | 0.27 | 0.080 | 1 | 06/29/18 09:03 | 07/05/18 18:13 | 7440-47-3 | |
| Cobalt | | <0.0074 | mg/kg | 0.091 | 0.0074 | 1 | 06/29/18 09:03 | 07/05/18 18:13 | 7440-48-4 | |
| Copper | | <0.11 | mg/kg | 0.37 | 0.11 | 1 | 06/29/18 09:03 | 07/05/18 18:13 | 7440-50-8 | |
| Lead | | <0.011 | mg/kg | 0.091 | 0.011 | 1 | 06/29/18 09:03 | 07/05/18 18:13 | 7439-92-1 | |
| Lithium | | <0.014 | mg/kg | 0.091 | 0.014 | 1 | 06/29/18 09:03 | 07/09/18 21:34 | 7439-93-2 | |
| Molybdenum | | <0.032 | mg/kg | 0.11 | 0.032 | 1 | 06/29/18 09:03 | 07/06/18 18:54 | 7439-98-7 | |
| Nickel | | <0.037 | mg/kg | 0.12 | 0.037 | 1 | 06/29/18 09:03 | 07/05/18 18:13 | 7440-02-0 | |
| Selenium | | <0.046 | mg/kg | 0.15 | 0.046 | 1 | 06/29/18 09:03 | 07/05/18 18:13 | 7782-49-2 | |
| Silver | | <0.016 | mg/kg | 0.054 | 0.016 | 1 | 06/29/18 09:03 | 07/05/18 18:13 | 7440-22-4 | |
| Strontium | | <0.15 | mg/kg | 0.49 | 0.15 | 1 | 06/29/18 09:03 | 07/05/18 18:13 | 7440-24-6 | |
| Thallium | | <0.012 | mg/kg | 0.091 | 0.012 | 1 | 06/29/18 09:03 | 07/06/18 18:54 | 7440-28-0 | |
| Vanadium | | <0.030 | mg/kg | 0.10 | 0.030 | 1 | 06/29/18 09:03 | 07/05/18 18:13 | 7440-62-2 | |
| Zinc | | <1.6 | mg/kg | 5.2 | 1.6 | 1 | 06/29/18 09:03 | 07/05/18 18:13 | 7440-66-6 | |
| **7473 Mercury, Tissue** | | Analytical Method: EPA 7473 | | | | | | | | |
| Mercury | | <0.0031 | mg/kg | 0.020 | 0.0031 | 1 | | 06/20/18 07:52 | 7439-97-6 | H3 |

raw data result

barium 1.866 x 5 = 9.33 mg/L U: 1,2,3,4,5,6,7,8,9,10,16,17,18,19,20



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(920)469-2436

# ANALYTICAL RESULTS

Project: CUF FISH TISSUE EQUIP. BLANKS
Pace Project No.: 40168712

**Sample: CUF-FH-LB-F-EB01-20180412** **Lab ID: 40168712001** Collected: 04/12/18 08:00 Received: 05/08/18 09:45 Matrix: Tissue

***Results reported on a "wet-weight" basis***

| Parameters | Results | Units | PQL | MDL | DF | Prepared | Analyzed | CAS No. | Qual |
|---|---|---|---|---|---|---|---|---|---|
| **6020 MET ICPMS** | Analytical Method: EPA 6020 Preparation Method: EPA 3050B | | | | | | | | |
| Antimony | x5 <0.011 | mg/kg | 0.090 | 0.011 | 1 | 06/29/18 09:03 | 07/05/18 17:31 | 7440-36-0 | |
| Arsenic | 0.255 0.051J | mg/kg | 0.090 | 0.027 | 1 | 06/29/18 09:03 | 07/05/18 17:31 | 7440-38-2 | |
| Barium | <0.041 | mg/kg | 0.14 | 0.041 | 1 | 06/29/18 09:03 | 07/05/18 17:31 | 7440-39-3 | |
| Beryllium | <0.030 | mg/kg | 0.099 | 0.030 | 1 | 06/29/18 09:03 | 07/09/18 21:06 | 7440-41-7 | |
| Boron | <0.27 | mg/kg | 0.91 | 0.27 | 1 | 06/29/18 09:03 | 07/09/18 21:06 | 7440-42-8 | |
| Cadmium | .225 0.045J | mg/kg | 0.090 | 0.0090 | 1 | 06/29/18 09:03 | 07/05/18 17:31 | 7440-43-9 | |
| Calcium | <22.9 | mg/kg | 76.2 | 22.9 | 1 | 06/29/18 09:03 | 07/05/18 17:31 | 7440-70-2 | |
| Chromium | <0.080 | mg/kg | 0.27 | 0.080 | 1 | 06/29/18 09:03 | 07/05/18 17:31 | 7440-47-3 | |
| Cobalt | <0.0074 | mg/kg | 0.090 | 0.0074 | 1 | 06/29/18 09:03 | 07/05/18 17:31 | 7440-48-4 | |
| Copper | 2.35 0.47 | mg/kg | 0.37 | 0.11 | 1 | 06/29/18 09:03 | 07/05/18 17:31 | 7440-50-8 | |
| Lead | <0.011 | mg/kg | 0.090 | 0.011 | 1 | 06/29/18 09:03 | 07/05/18 17:31 | 7439-92-1 | |
| Lithium | <0.014 | mg/kg | 0.090 | 0.014 | 1 | 06/29/18 09:03 | 07/09/18 21:06 | 7439-93-2 | |
| Molybdenum | <0.032 | mg/kg | 0.11 | 0.032 | 1 | 06/29/18 09:03 | 07/06/18 18:11 | 7439-98-7 | |
| Nickel | <0.037 | mg/kg | 0.12 | 0.037 | 1 | 06/29/18 09:03 | 07/05/18 17:31 | 7440-02-0 | |
| Selenium | <0.046 | mg/kg | 0.15 | 0.046 | 1 | 06/29/18 09:03 | 07/05/18 17:31 | 7782-49-2 | |
| Silver | <0.016 | mg/kg | 0.054 | 0.016 | 1 | 06/29/18 09:03 | 07/05/18 17:31 | 7440-22-4 | |
| Strontium | <0.14 | mg/kg | 0.48 | 0.14 | 1 | 06/29/18 09:03 | 07/05/18 17:31 | 7440-24-6 | |
| Thallium | <0.012 | mg/kg | 0.090 | 0.012 | 1 | 06/29/18 09:03 | 07/06/18 18:11 | 7440-28-0 | |
| Vanadium | <0.030 | mg/kg | 0.10 | 0.030 | 1 | 06/29/18 09:03 | 07/05/18 17:31 | 7440-62-2 | |
| Zinc | <1.6 | mg/kg | 5.2 | 1.6 | 1 | 06/29/18 09:03 | 07/05/18 17:31 | 7440-66-6 | |
| **7473 Mercury, Tissue** | Analytical Method: EPA 7473 | | | | | | | | |
| Mercury | <0.0031 | mg/kg | 0.020 | 0.0031 | 1 | | 06/07/18 09:53 | 7439-97-6 | H3 |

See below for qualifiers

raw data results

arsenic 0.567 x5 = 2.835 U: 1,3,11,12,13,14,15,17,18,19,20
Cadmium 0.495 x5 = 2.475 U: 1
copper 5.213 x5 = 26.07 U: 1,2,3,4,5,6,7,8,9,10,11,12,13,14,15,16,17,18,19,20



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FORM II INORGANIC-1

CRDL CHECK STANDARD

Lab Name: Pace Analytical - Green Bay SDG No. : 40182297 Contract: 0777010 CUMBERLAND FOSSIL PLAN

CRDL Check Standard Source: 217187 Analysis Date/Time: 02/05/2019 15:35

Concentration Units: ug/L

70-130%

| Analyte | CRDL Check Standard | | | |
|---|---|---|---|---|
| | True | Found | %R | Control Limit %R |
| Boron | 5.0 | 4.4 | 88.1 | 70-130 |
| Calcium | ~~250~~ 500 | 520 | ~~208.0~~ 104.0 | 70-130 |
| Copper | ~~1.0~~ 5.0 | 5.1 | ~~507.0~~ 101.4 | 70-130 |
| Strontium | ~~1.0~~ 5.0 | 5.0 | ~~497.0~~ 99.4 | 70-130 |
| Zinc | 5.0 | 5.9 | 117.1 | 70-130 |

* Issue indicated in the case narrative

FORM II INORGANIC-1

CRDL CHECK STANDARD

Lab Name: Pace Analytical - Green Bay SDG No. : 40182297 Contract: 0777010 CUMBERLAND FOSSIL PLAN

CRDL Check Standard Source: 217187 Analysis Date/Time: 02/05/2019 20:17

Concentration Units: ug/L

| Analyte | CRDL Check Standard | | | |
|---|---|---|---|---|
| | True | Found | %R | Control Limit %R |
| Boron | 5.0 | 4.4 | 87.5 | 70-130 |
| Calcium | ~~250~~ 500 | 555 | ~~222.0~~ 1160 | 70-130 |
| Copper | ~~1.0~~ 5.0 | 4.8 | ~~482.7~~ 96.5 | 70-130 |
| Strontium | ~~1.0~~ 5.0 | 5.0 | ~~499.7~~ 99.9 | 70-130 |
| Zinc | 5.0 DC 3/4/19 | 5.3 | 105.8 DC 3/4/19 | 70-130 |

Issue indicated in case narrative

FORM II INORGANIC-1
CRDL CHECK STANDARD

Lab Name: Pace Analytical - Green Bay SDG No. : 40182297 Contract: 0777010 CUMBERLAND FOSSIL PLAN

CRDL Check Standard Source: 217198 Analysis Date/Time: 02/05/2019 08:44

Concentration Units: ug/L

70-130%

| Analyte | CRDL Check Standard | | | |
|---|---|---|---|---|
| | True | Found | %R | Control Limit %R |
| Boron | 5.0 | 4.7 | 93.4 | 70-130 |
| Calcium | ~~250~~ 500 | 536 | ~~214.6~~ 107.3 | 70-130 |
| Copper | ~~1.0~~ 5.0 | 5.6 | ~~562.2~~ 112.4 | 70-130 |
| Strontium | ~~1.0~~ 5.0 | 5.0 | ~~496.5~~ 99.3 | 70-130 |
| Zinc | 5.0 Data Entry | 4.9 | 98.1 mc 3/04/19 | 70-130 |

* Issue indicate in case narrative

FORM II INORGANIC-1

CRDL CHECK STANDARD

Lab Name: Pace Analytical - Green Bay SDG No. : 40182297 Contract: 0777010 CUMBERLAND FOSSIL PLAN

CRDL Check Standard Source: 217198 Analysis Date/Time: 02/05/2019 10:13 ✓

Concentration Units: ug/L

70-130%

| Analyte | CRDL Check Standard | | | |
|---|---|---|---|---|
| | True | Found | %R | Control Limit %R |
| Boron | 5.0 | 4.4 | 88.5 | 70-130 |
| Calcium | ~~250~~ 500 | 527 | ~~210.7~~ 105.5 | 70-130 |
| Copper | ~~1.0~~ 5.0 | 5.7 ✓ | ~~568.2~~ 113.6 | 70-130 |
| Strontium | ~~1.0~~ 5.0 | 4.9 ✓ | ~~486.9~~ 97.4 | 70-130 |
| Zinc | 5.0 | 4.8 | 96.8 ✓ | 70-130 |

See case narrative

FORM II INORGANIC-1

CRDL CHECK STANDARD

Lab Name: Pace Analytical - Green Bay SDG No. : 40182297 Contract: 0777010 CUMBERLAND FOSSIL PLAN

CRDL Check Standard Source: 217198 Analysis Date/Time: 02/05/2019 12:16

Concentration Units: ug/L

70-130%

| Analyte | CRDL Check Standard | | | |
|---|---|---|---|---|
| | True | Found | %R | Control Limit %R |
| Boron | 5.0 | 4.8 | 95.4 | 70-130 |
| Calcium | ~~250~~ 500 | 507 | ~~202.9~~ 101.5 | 70-130 |
| Copper | ~~1.0~~ 5.0 | 5.7 | ~~571.1~~ 114.2 | 70-130 |
| Strontium | ~~1.0~~ 5.0 | 4.9 | ~~494.3~~ 98.9 | 70-130 |
| Zinc | 5.0 0c315th | 5.5 | 110.1 0c315th | 70-130 |

see case narrative

FORM II INORGANIC-1

CRDL CHECK STANDARD

Lab Name: Pace Analytical - Green Bay SDG No. : 40182297 Contract: 0777010 CUMBERLAND FOSSIL PLAN

CRDL Check Standard Source: 217198 Analysis Date/Time: 02/05/2019 13:58

Concentration Units: ug/L

70-130%

| Analyte | CRDL Check Standard | | | |
|---|---|---|---|---|
| | True | Found | %R | Control Limit %R |
| Boron | 5.0 | 4.8 | 95.1 | 70-130 |
| Calcium | 250 500 | 501 | ~~200~~.3 100.2 | 70-130 |
| Copper | 1.0 5.00 | 5.7 | ~~566~~.8 113.9 | 70-130 |
| Strontium | 1.0 5.0 | 5.0 | ~~496~~.6 99.3 | 70-130 |
| Zinc | 5.0 DC 3/5/19 | 5.1 | 102.3 K 3/5/19 | 70-130 |

See case narrative

FORM II INORGANIC-1
CRDL CHECK STANDARD

Lab Name: Pace Analytical - Green Bay SDG No. : 40182297 Contract: 0777010 CUMBERLAND FOSSIL PLAN

CRDL Check Standard Source: 217198 Analysis Date/Time: 02/05/2019 14:45

Concentration Units: ug/L

70-130%

| Analyte | CRDL Check Standard | | | |
|---|---|---|---|---|
| | True | Found | %R | Control Limit %R |
| Boron | 5.0 | 5.2 | 104.6 | 70-130 |
| Calcium | 250 500 | 496 | ~~198.3~~ 99.2 | 70-130 |
| Copper | 1.0 5.0 | 5.2 | ~~521.7~~ 104.3 | 70-130 |
| Strontium | 1.0 5.0 | 5.0 | ~~497.1~~ 99.4 | 70-130 |
| Zinc | 5.0 DC31874 | 6.0 | 119.6 DC31874 | 70-130 |

see case narr

FORM II INORGANIC-1

CRDL CHECK STANDARD

Lab Name: Pace Analytical - Green Bay SDG No. : 40182297 Contract: 0777010 CUMBERLAND FOSSIL PLAN

CRDL Check Standard Source: 217198 Analysis Date/Time: 02/05/2019 16:00

Concentration Units: ug/L

70-130%

| Analyte | CRDL Check Standard | | | |
|---|---|---|---|---|
| | True | Found | %R | Control Limit %R |
| Boron | 5.0 | 4.4 | 88.3 | 70-130 |
| Calcium | ~~250~~ 500 | 504 | ~~201.8~~ 100.9 | 70-130 |
| Copper | ~~1.0~~ 5.0 | 5.2 | ~~515.3~~ 103.6 | 70-130 |
| Strontium | ~~1.0~~ 5.0 | 5.0 | ~~501.2~~ 100.2 | 70-130 |
| Zinc | 5.0 RC 3/5/19 | 5.9 | 118.4 RC 3/5/19 | 70-130 |

see case narr

FORM III INORGANIC-1

BLANKS

Lab Name: Pace Analytical - Green Bay SDG No. : 40182297 Contract : 0777010 CUMBERLAND FOSSIL PLAN

Method Blank Matrix: Tissue Instrument ID: 40ICM3

Method Blank Concentration Units: mg/kg

| Analyte | Initial Calibration Blank (ug/L) | | Continuing Calibration Blank (ug/L) | | | | | | Method Blank (mg/kg) | |
|---|---|---|---|---|---|---|---|---|---|---|
| | 02/05/2019 08:30 ✓ | C | 02/05/2019 09:11 | C | 02/05/2019 09:59 | C | 02/05/2019 10:43 ✓ | C | 1821391 | C |
| Antimony | 0.23 | J | 0.15 | U | 0.15 | U | 0.15 | U | <0.016 | U |
| Arsenic | 0.30 | J | 0.28 | U | 0.28 | U | 0.28 | U | <0.030 | U |
| Barium | 1.5 | U | 1.5 | U | 1.5 | U | 1.5 | U | <0.031 | U |
| Beryllium | 0.18 | U | 0.18 | U | 0.18 | U | 0.18 | U | <0.033 | U |
| Boron | 3.3 | U | 3.3 | U | 3.3 | U | 3.3 | U | <0.70 | U |
| Cadmium | 0.26 | J | 0.15 | U | 0.15 | U | 0.15 | U | <0.014 | U |
| Calcium | 69.8 | U | 69.8 | U | 69.8 | U | 69.8 | U | <25.4 | U |
| Chromium | 1.0 | U | 1.0 | U | 1.0 | U | 1.0 | U | <0.088 | U |
| Cobalt | 0.29 | J | 0.12 | U | 0.12 | U | 0.16 | J | <0.0082 | U |
| Copper | 1.1 | U | 1.1 | U | 1.1 | U | 1.1 | U | <0.28 | U |
| Lithium | 0.19 | U | 0.19 | U | 0.19 | U | 0.19 | U | <0.021 | U |
| Molybdenum | 0.44 | U | 0.44 | U | 0.44 | U | 0.61 | J | <0.036 | U |
| Nickel | 0.40 | U | 0.40 | U | 0.40 | U | 0.40 | U | <0.041 | U |
| Selenium | 0.32 | U | 0.32 | U | 0.32 | U | 0.32 | U | <0.051 | U |
| Silver | 0.15 | J | 0.10 | U | 0.10 | U | 0.10 | U | <0.011 | U |
| Strontium | 0.78 | U | 0.78 | U | 0.78 | U | 0.78 | U | <0.16 | U |
| Vanadium | 0.34 | J | 0.32 | U | 0.32 | U | 0.32 | U | <0.033 | U |
| Zinc | 4.6 | U | 4.6 | U | 4.6 | U | 4.6 | U | <1.7 | U |

clear

Sb
0.23x5= 1.15ug/L
U*: 1

As
0.30x5= 1.5ug/L
U*: 1,3, 11-15, 17-20

does not bracket samples, no eval

Co
> conc in LCB, used for blank eval

Cd
0.26x5= 1.3ug/L
U*: 1

Co
0.29x5= 1.29ug/L
U*: 1-20

Mo
higher conc in CCB@ 10:25 used for eval

Ag
0.15x5= 0.75ug/L
U*: 1

V
0.34x5= 1.7ug/L
U*: 16, 19

FORM III INORGANIC-2
BLANKS

Lab Name: Pace Analytical - Green Bay SDG No. : 40182297 Contract : 0777010 CUMBERLAND FOSSIL PLAN

Method Blank Matrix: Tissue Instrument ID: 40ICM3

Method Blank Concentration Units: mg/kg

| Analyte | Initial Calibration Blank | | Continuing Calibration Blank (ug/L) | | | | | | Tissue Blank | |
|---|---|---|---|---|---|---|---|---|---|---|
| | | C | 02/05/2019 12:02 | C | 02/05/2019 12:43 | C | 02/05/2019 13:44 | C | 1821392 | C |
| Antimony | | | 0.15 | U | 0.15 | U | 0.15 | U | <0.016 | U |
| Arsenic | | | 0.28 | U | 0.28 | U | 0.28 | U | <0.030 | U |
| Barium | | | 1.5 | U | 1.5 | U | 1.5 | U | <0.031 | U |
| Beryllium | | | 0.18 | U | 0.18 | U | 0.18 | U | <0.033 | U |
| Boron | | | 3.3 | U | 3.3 | U | 3.3 | U | <0.70 | U |
| Cadmium | | | 0.15 | U | 0.17 | J | 0.15 | U | <0.014 | U |
| Calcium | | | 69.8 | U | 69.8 | U | 69.8 | U | 44.0 | J |
| Chromium | | | 1.0 | U | 1.0 | U | 1.0 | U | <0.088 | U |
| Cobalt | | | 0.12 | U | 0.20 | J | 0.17 | J | <0.0082 | U |
| Copper | | | 1.1 | U | 1.1 | U | 1.1 | U | <0.28 | U |
| Lithium | | | 0.19 | U | 0.19 | U | 0.19 | U | <0.021 | U |
| Molybdenum | | | 0.44 | U | 0.76 | J | 0.44 | U | <0.036 | U |
| Nickel | | | 0.40 | U | 0.40 | U | 0.40 | U | 0.046 | J |
| Selenium | | | 0.32 | U | 0.32 | U | 0.32 | U | 0.16 | J |
| Silver | | | 0.10 | U | 0.10 | U | 0.10 | U | <0.011 | U |
| Strontium | | | 0.78 | U | 0.78 | U | 0.78 | U | <0.16 | U |
| Vanadium | | | 0.32 | U | 0.32 | U | 0.40 | J | <0.033 | U |
| Zinc | | | 4.6 | U | 4.6 | U | 4.6 | U | 6.7 | |

Clear

Chicken blank, no eval/qual

Cd+Co
higher conc. in LCB used for qual eval

V
detection does not bracket any (+) results, no qual

Mo
higher conc in CCB @ 14:25 used for eval

FORM III INORGANIC-3

BLANKS

Lab Name: Pace Analytical - Green Bay SDG No. : 40182297 Contract : 0777010 CUMBERLAND FOSSIL PLAN

Method Blank Matrix: Instrument ID: 40ICM3

Method Blank Concentration Units:

| Analyte | Initial Calibration Blank | | Continuing Calibration Blank (ug/L) | | | | | |
|---|---|---|---|---|---|---|---|---|
| | | C | 02/05/2019 14:25 | C | 02/05/2019 15:47 | C | 02/05/2019 16:28 | C |
| Antimony | | | 0.17 | J | 0.15 | U | 0.15 | U |
| Arsenic | | | 0.28 | U | 0.28 | U | 0.28 | U |
| Barium | | | 1.5 | U | 1.5 | U | 1.5 | U |
| Beryllium | | | 0.18 | U | 0.18 | U | 0.18 | U |
| Boron | | | 3.3 | U | 3.3 | U | 3.3 | U |
| Cadmium | | | 0.25 | J | 0.15 | U | 0.15 | U |
| Calcium | | | 69.8 | U | 69.8 | U | 69.8 | U |
| Chromium | | | 1.0 | U | 1.0 | U | 1.0 | U |
| Cobalt | | | 0.25 | J | 0.14 | J | 0.19 | J |
| Copper | | | 1.1 | U | 1.1 | U | 1.1 | U |
| Lithium | | | 0.19 | U | 0.19 | U | 0.19 | U |
| Molybdenum | | | 0.89 | J | 0.44 | U | 0.65 | J |
| Nickel | | | 0.40 | U | 0.40 | U | 0.40 | U |
| Selenium | | | 0.32 | U | 0.32 | U | 0.32 | U |
| Silver | | | 0.13 | J | 0.10 | U | 0.10 | U |
| Strontium | | | 0.78 | U | 0.78 | U | 0.78 | U |
| Vanadium | | | 0.32 | U | 0.32 | U | 0.32 | U |
| Zinc | | | 4.6 | U | 4.6 | U | 4.6 | U |

Sb
does not bracket my (+), no qual

does not bracket, no eval

Co + Cd + Ag
ICB used for blank qual eval, see pg 128 for qualifiers

Mo
Continuing CCB hits 0.89 ug/L used to evaluate all results
0.89 ug/L x 5 = 4.45 ug/L
V*: 1, 5, 13, 19

FORM XIII INORGANIC-1
ANALYSIS RUN LOG

Lab Name: Pace Analytical - Green Bay SDG No. : 40182297 Contract: 0777010 CUMBERLAND FOSSIL PLAN

Instrument ID: 40ICM3 Analysis Method: EPA 6020

Start Date: 02/05/2019 07:43 End Date: 02/05/2019 16:28

| Sample Name | Lab Sample ID | D/F | Date | Time | Ag | As | B | Ba | Be | Ca | Cd | Co | Cr | Cu | Li | Mo | Ni | Sb | Se | Sr |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 11946137CAL0 | 11946137CAL0 | 1 | 02/05/2019 | 07:43 | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X |
| 11946138CAL1 | 11946138CAL1 | 1 | 02/05/2019 | 07:49 | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X |
| 11946139CAL2 | 11946139CAL2 | 1 | 02/05/2019 | 07:56 | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X |
| 11946140CAL3 | 11946140CAL3 | 1 | 02/05/2019 | 08:03 | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X |
| 11946141CAL4 | 11946141CAL4 | 1 | 02/05/2019 | 08:10 | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X |
| 11946142CAL5 | 11946142CAL5 | 1 | 02/05/2019 | 08:17 | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X |
| 11946143ICV | 11946143ICV | 1 | 02/05/2019 | 08:24 | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X |
| 11946145ICB | 11946145ICB | 1 | 02/05/2019 | 08:30 | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X |
| 11946146CRDL | 11946146CRDL | 1 | 02/05/2019 | 08:37 | X | X | | X | X | | X | X | X | | X | X | X | X | X | |
| 11946147CRDL | 11946147CRDL | 1 | 02/05/2019 | 08:44 | | | X | | | X | | | | X | | | | | | X |
| 11946148ICSA | 11946148ICSA | 1 | 02/05/2019 | 08:51 | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X |
| 11946149ICSAB | 11946149ICSAB | 1 | 02/05/2019 | 08:58 | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X |
| 11946150CCV | 11946150CCV | 1 | 02/05/2019 | 09:04 | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X |
| 11946151CCB | 11946151CCB | 1 | 02/05/2019 | 09:11 | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X |
| 1821391BLANK | 1821391 | 1 | 02/05/2019 | 09:18 | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X |
| 1821392SBLK | 1821392 | 1 | 02/05/2019 | 09:25 | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X |
| 1821394LCS | 1821394 | 1 | 02/05/2019 | 09:32 | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X |
| 1821393SRM | 1821393 | 2 | 02/05/2019 | 09:39 | | X | | | | | X | | | | | X | | | X | X |
| 1821393SRM | 1821393 | 1 | 02/05/2019 | 09:45 | | | | | | | | X | X | X | | | X | | | |
| 11946152CCV | 11946152CCV | 1 | 02/05/2019 | 09:52 | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X |
| 11946153CCB | 11946153CCB | 1 | 02/05/2019 | 09:59 | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X |
| 11946154CRDL | 11946154CRDL | 1 | 02/05/2019 | 10:06 | X | X | | X | X | | X | X | X | | X | X | X | X | X | |
| 11946155CRDL | 11946155CRDL | 1 | 02/05/2019 | 10:13 | | | X | | | X | | | | X | | | | | | X |
| 11946156ICSA | 11946156ICSA | 1 | 02/05/2019 | 10:19 | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X |
| 11946157ICSAB | 11946157ICSAB | 1 | 02/05/2019 | 10:26 | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X |
| 11946158CCV | 11946158CCV | 1 | 02/05/2019 | 10:33 | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X |
| 11946159CCB | 11946159CCB | 1 | 02/05/2019 | 10:43 | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X |
| CUF-FH-CC-CURD-O- | 40182297006 | 2 | 02/05/2019 | 10:50 | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X |
| 1821395MS | 1821395 | 2 | 02/05/2019 | 10:57 | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X |
| 1821396MSD | 1821396 | 2 | 02/05/2019 | 11:04 | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X |
| 1821742PDS | 1821742 | 2 | 02/05/2019 | 11:11 | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X |
| CUF-FH-BG-CURD-O- | 40182297001 | 2 | 02/05/2019 | 11:17 | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X |
| 1821741SD | 1821741 | 10 | 02/05/2019 | 11:24 | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X |
| CUF-FH-BG-CURA-O- | 40182297002 | 2 | 02/05/2019 | 11:31 | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X |
| CUF-FH-BG-CURU-O- | 40182297003 | 2 | 02/05/2019 | 11:38 | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X |
| CUF-FH-BG-WCD-O- | 40182297004 | 2 | 02/05/2019 | 11:45 | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X |
| 11946160CCV | 11946160CCV | 1 | 02/05/2019 | 11:55 | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X |
| 11946161CCB | 11946161CCB | 1 | 02/05/2019 | 12:02 | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X |
| 11946162CRDL | 11946162CRDL | 1 | 02/05/2019 | 12:09 | X | X | | X | X | | X | X | X | | X | X | X | X | X | |
| 11946163CRDL | 11946163CRDL | 1 | 02/05/2019 | 12:16 | | | X | | | X | | | | X | | | | | | X |
| 11946164ICSA | 11946164ICSA | 1 | 02/05/2019 | 12:22 | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X |
| 11946165ICSAB | 11946165ICSAB | 1 | 02/05/2019 | 12:29 | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X |
| 11946166CCV | 11946166CCV | 1 | 02/05/2019 | 12:36 | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X |
| 11946167CCB | 11946167CCB | 1 | 02/05/2019 | 12:43 | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X |
| CUF-FH-BG-WCU-O- | 40182297005 | 2 | 02/05/2019 | 12:50 | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X |

FORM XIII INORGANIC-2
ANALYSIS RUN LOG

Lab Name: Pace Analytical - Green Bay SDG No. : 40182297 Contract: 0777010 CUMBERLAND FOSSIL PLAN

Instrument ID: 40ICM3 Analysis Method: EPA 6020

Start Date: 02/05/2019 07:43 End Date: 02/05/2019 16:28

| Sample Name | Lab Sample ID | D/F | Date | Time | Ag | As | B | Ba | Be | Ca | Cd | Co | Cr | Cu | Li | Mo | Ni | Sb | Se | Sr |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| CUF-FH-CC-CURA-O- | 40182297007 | 2 | 02/05/2019 | 12:56 | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X |
| CUF-FH-CC-CURU-O- | 40182297008 | 2 | 02/05/2019 | 13:03 | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X |
| CUF-FH-CC-WCD-O- | 40182297009 | 2 | 02/05/2019 | 13:10 | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X |
| CUF-FH-CC-WCU-O- | 40182297010 | 2 | 02/05/2019 | 13:17 | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X |
| CUF-FH-LB-CURD-O- | 40182297011 | 2 | 02/05/2019 | 13:24 | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X |
| CUF-FH-LB-CURA-O- | 40182297012 | 2 | 02/05/2019 | 13:30 | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X |
| 11946168CCV | 11946168CCV | 1 | 02/05/2019 | 13:37 | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X |
| 11946170CCB | 11946170CCB | 1 | 02/05/2019 | 13:44 | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X |
| 11946171CRDL | 11946171CRDL | 1 | 02/05/2019 | 13:51 | X | X | | X | X | | X | X | X | | X | X | X | X | X | |
| 11946172CRDL | 11946172CRDL | 1 | 02/05/2019 | 13:58 | | | X | | | X | | | | X | | | | | | X |
| 11946173ICSA | 11946173ICSA | 1 | 02/05/2019 | 14:05 | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X |
| 11946174ICSAB | 11946174ICSAB | 1 | 02/05/2019 | 14:11 | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X |
| 11946175CCV | 11946175CCV | 1 | 02/05/2019 | 14:18 | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X |
| 11946176CCB | 11946176CCB | 1 | 02/05/2019 | 14:25 | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X |
| CUF-FH-LB-CURU-O- | 40182297013 | 2 | 02/05/2019 | 14:32 | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X |
| 11946177CRDL | 11946177CRDL | 1 | 02/05/2019 | 14:39 | X | X | | X | X | | X | X | X | | X | X | X | X | X | |
| 11946178CRDL | 11946178CRDL | 1 | 02/05/2019 | 14:45 | | | X | | | X | | | | X | | | | | | X |
| CUF-FH-LB-WCD-O- | 40182297014 | 2 | 02/05/2019 | 14:52 | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X |
| CUF-FH-LB-WCU-O- | 40182297015 | 2 | 02/05/2019 | 14:59 | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X |
| CUF-FH-RS-CURD-O- | 40182297016 | 2 | 02/05/2019 | 15:06 | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X |
| CUF-FH-RS-CURA-O- | 40182297017 | 2 | 02/05/2019 | 15:13 | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X |
| CUF-FH-RS-CURU-O- | 40182297018 | 2 | 02/05/2019 | 15:20 | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X |
| CUF-FH-RS-WCD-O- | 40182297019 | 2 | 02/05/2019 | 15:26 | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X |
| CUF-FH-RS-WCU-O- | 40182297020 | 2 | 02/05/2019 | 15:33 | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X |
| 11946179CCV | 11946179CCV | 1 | 02/05/2019 | 15:40 | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X |
| 11946180CCB | 11946180CCB | 1 | 02/05/2019 | 15:47 | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X |
| 11946181CRDL | 11946181CRDL | 1 | 02/05/2019 | 15:54 | X | X | | X | X | | X | X | X | | X | X | X | X | X | |
| 11946182CRDL | 11946182CRDL | 1 | 02/05/2019 | 16:00 | | | X | | | X | | | | X | | | | | | X |
| 11946183ICSA | 11946183ICSA | 1 | 02/05/2019 | 16:07 | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X |
| 11946184ICSAB | 11946184ICSAB | 1 | 02/05/2019 | 16:14 | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X |
| 11946185CCV | 11946185CCV | 1 | 02/05/2019 | 16:21 | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X |
| 11946186CCB | 11946186CCB | 1 | 02/05/2019 | 16:28 | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X |

FORM XIII INORGANIC-1
ANALYSIS RUN LOG

Lab Name: Pace Analytical - Green Bay SDG No. : 40182297 Contract: 0777010 CUMBERLAND FOSSIL PLAN

Instrument ID: 40ICM3 Analysis Method: EPA 6020

Start Date: 02/05/2019 07:43 End Date: 02/05/2019 16:28

| Sample Name | Lab Sample ID | D/F | Date | Time | V | Zn |
|---|---|---|---|---|---|---|
| 11946137CAL0 | 11946137CAL0 | 1 | 02/05/2019 | 07:43 | X | X |
| 11946138CAL1 | 11946138CAL1 | 1 | 02/05/2019 | 07:49 | X | X |
| 11946139CAL2 | 11946139CAL2 | 1 | 02/05/2019 | 07:56 | X | X |
| 11946140CAL3 | 11946140CAL3 | 1 | 02/05/2019 | 08:03 | X | X |
| 11946141CAL4 | 11946141CAL4 | 1 | 02/05/2019 | 08:10 | X | X |
| 11946142CAL5 | 11946142CAL5 | 1 | 02/05/2019 | 08:17 | X | X |
| 11946143ICV | 11946143ICV | 1 | 02/05/2019 | 08:24 | X | X |
| 11946145ICB | 11946145ICB | 1 | 02/05/2019 | 08:30 | X | X |
| 11946146CRDL | 11946146CRDL | 1 | 02/05/2019 | 08:37 | X | |
| 11946147CRDL | 11946147CRDL | 1 | 02/05/2019 | 08:44 | | X |
| 11946148ICSA | 11946148ICSA | 1 | 02/05/2019 | 08:51 | X | X |
| 11946149ICSAB | 11946149ICSAB | 1 | 02/05/2019 | 08:58 | X | X |
| 11946150CCV | 11946150CCV | 1 | 02/05/2019 | 09:04 | X | X |
| 11946151CCB | 11946151CCB | 1 | 02/05/2019 | 09:11 | X | X |
| 1821391BLANK | 1821391 | 1 | 02/05/2019 | 09:18 | X | X |
| 1821392SBLK | 1821392 | 1 | 02/05/2019 | 09:25 | X | X |
| 1821394LCS | 1821394 | 1 | 02/05/2019 | 09:32 | X | X |
| 1821393SRM | 1821393 | 2 | 02/05/2019 | 09:39 | | |
| 1821393SRM | 1821393 | 1 | 02/05/2019 | 09:45 | X | X |
| 11946152CCV | 11946152CCV | 1 | 02/05/2019 | 09:52 | X | X |
| 11946153CCB | 11946153CCB | 1 | 02/05/2019 | 09:59 | X | X |
| 11946154CRDL | 11946154CRDL | 1 | 02/05/2019 | 10:06 | X | |
| 11946155CRDL | 11946155CRDL | 1 | 02/05/2019 | 10:13 | | X |
| 11946156ICSA | 11946156ICSA | 1 | 02/05/2019 | 10:19 | X | X |
| 11946157ICSAB | 11946157ICSAB | 1 | 02/05/2019 | 10:26 | X | X |
| 11946158CCV | 11946158CCV | 1 | 02/05/2019 | 10:33 | X | X |
| 11946159CCB | 11946159CCB | 1 | 02/05/2019 | 10:43 | X | X |
| CUF-FH-CC-CURD-O- | 40182297006 | 2 | 02/05/2019 | 10:50 | X | X |
| 1821395MS | 1821395 | 2 | 02/05/2019 | 10:57 | X | X |
| 1821396MSD | 1821396 | 2 | 02/05/2019 | 11:04 | X | X |
| 1821742PDS | 1821742 | 2 | 02/05/2019 | 11:11 | X | X |
| CUF-FH-BG-CURD-O- | 40182297001 | 2 | 02/05/2019 | 11:17 | X | X |
| 1821741SD | 1821741 | 10 | 02/05/2019 | 11:24 | X | X |
| CUF-FH-BG-CURA-O- | 40182297002 | 2 | 02/05/2019 | 11:31 | X | X |
| CUF-FH-BG-CURU-O- | 40182297003 | 2 | 02/05/2019 | 11:38 | X | X |
| CUF-FH-BG-WCD-O- | 40182297004 | 2 | 02/05/2019 | 11:45 | X | X |
| 11946160CCV | 11946160CCV | 1 | 02/05/2019 | 11:55 | X | X |
| 11946161CCB | 11946161CCB | 1 | 02/05/2019 | 12:02 | X | X |
| 11946162CRDL | 11946162CRDL | 1 | 02/05/2019 | 12:09 | X | |
| 11946163CRDL | 11946163CRDL | 1 | 02/05/2019 | 12:16 | | X |
| 11946164ICSA | 11946164ICSA | 1 | 02/05/2019 | 12:22 | X | X |
| 11946165ICSAB | 11946165ICSAB | 1 | 02/05/2019 | 12:29 | X | X |
| 11946166CCV | 11946166CCV | 1 | 02/05/2019 | 12:36 | X | X |
| 11946167CCB | 11946167CCB | 1 | 02/05/2019 | 12:43 | X | X |
| CUF-FH-BG-WCU-O- | 40182297005 | 2 | 02/05/2019 | 12:50 | X | X |

FORM XIII INORGANIC-2
ANALYSIS RUN LOG

Lab Name: Pace Analytical - Green Bay SDG No. : 40182297 Contract: 0777010 CUMBERLAND FOSSIL PLAN

Instrument ID: 40ICM3 Analysis Method: EPA 6020

Start Date: 02/05/2019 07:43 End Date: 02/05/2019 16:28

| Sample Name | Lab Sample ID | D/F | Date | Time | V | Zn |
|---|---|---|---|---|---|---|
| CUF-FH-CC-CURA-O- | 40182297007 | 2 | 02/05/2019 | 12:56 | X | X |
| CUF-FH-CC-CURU-O- | 40182297008 | 2 | 02/05/2019 | 13:03 | X | X |
| CUF-FH-CC-WCD-O- | 40182297009 | 2 | 02/05/2019 | 13:10 | X | X |
| CUF-FH-CC-WCU-O- | 40182297010 | 2 | 02/05/2019 | 13:17 | X | X |
| CUF-FH-LB-CURD-O- | 40182297011 | 2 | 02/05/2019 | 13:24 | X | X |
| CUF-FH-LB-CURA-O- | 40182297012 | 2 | 02/05/2019 | 13:30 | X | X |
| 11946168CCV | 11946168CCV | 1 | 02/05/2019 | 13:37 | X | X |
| 11946170CCB | 11946170CCB | 1 | 02/05/2019 | 13:44 | X | X |
| 11946171CRDL | 11946171CRDL | 1 | 02/05/2019 | 13:51 | X | |
| 11946172CRDL | 11946172CRDL | 1 | 02/05/2019 | 13:58 | | X |
| 11946173ICSA | 11946173ICSA | 1 | 02/05/2019 | 14:05 | X | X |
| 11946174ICSAB | 11946174ICSAB | 1 | 02/05/2019 | 14:11 | X | X |
| 11946175CCV | 11946175CCV | 1 | 02/05/2019 | 14:18 | X | X |
| 11946176CCB | 11946176CCB | 1 | 02/05/2019 | 14:25 | X | X |
| CUF-FH-LB-CURU-O- | 40182297013 | 2 | 02/05/2019 | 14:32 | X | X |
| 11946177CRDL | 11946177CRDL | 1 | 02/05/2019 | 14:39 | X | |
| 11946178CRDL | 11946178CRDL | 1 | 02/05/2019 | 14:45 | | X |
| CUF-FH-LB-WCD-O- | 40182297014 | 2 | 02/05/2019 | 14:52 | X | X |
| CUF-FH-LB-WCU-O- | 40182297015 | 2 | 02/05/2019 | 14:59 | X | X |
| CUF-FH-RS-CURD-O- | 40182297016 | 2 | 02/05/2019 | 15:06 | X | X |
| CUF-FH-RS-CURA-O- | 40182297017 | 2 | 02/05/2019 | 15:13 | X | X |
| CUF-FH-RS-CURU-O- | 40182297018 | 2 | 02/05/2019 | 15:20 | X | X |
| CUF-FH-RS-WCD-O- | 40182297019 | 2 | 02/05/2019 | 15:26 | X | X |
| CUF-FH-RS-WCU-O- | 40182297020 | 2 | 02/05/2019 | 15:33 | X | X |
| 11946179CCV | 11946179CCV | 1 | 02/05/2019 | 15:40 | X | X |
| 11946180CCB | 11946180CCB | 1 | 02/05/2019 | 15:47 | X | X |
| 11946181CRDL | 11946181CRDL | 1 | 02/05/2019 | 15:54 | X | |
| 11946182CRDL | 11946182CRDL | 1 | 02/05/2019 | 16:00 | | X |
| 11946183ICSA | 11946183ICSA | 1 | 02/05/2019 | 16:07 | X | X |
| 11946184ICSAB | 11946184ICSAB | 1 | 02/05/2019 | 16:14 | X | X |
| 11946185CCV | 11946185CCV | 1 | 02/05/2019 | 16:21 | X | X |
| 11946186CCB | 11946186CCB | 1 | 02/05/2019 | 16:28 | X | X |

FORM III INORGANIC-1
BLANKS

Lab Name: Pace Analytical - Green Bay SDG No. : 40182297 Contract : 0777010 CUMBERLAND FOSSIL PLAN

Method Blank Matrix: Tissue Instrument ID: 40HG4

Method Blank Concentration Units: mg/kg

| Analyte | Initial Calibration Blank (mg/kg) | | Continuing Calibration Blank (mg/kg) | | | | | | Method Blank | |
|---|---|---|---|---|---|---|---|---|---|---|
| | 02/25/2019 07:53 ✓ | C | 02/25/2019 11:00 ✓ | C | 02/25/2019 14:22 ✓ | C | 02/25/2019 16:53 ✓ | C | 1829514 | C |
| Mercury | 0.020 | U | 0.020 | U | 0.020 | U | 0.020 | U | <0.0032 | U |
| | 0.0058 mg/kg | | Clear | | Clear | | Clear | | Clear | |

0.5780 mg x 5 = 2.89 mg

U*, BL: 2-4, 7, 9, 11-15, 17-19

FORM IX INORGANIC-1
INSTRUMENT DETECTION LIMITS

Lab Name: Pace Analytical - Green Bay SDG No. : 40182297 Contract: 0777010 CUMBERLAND FOSSIL PLAN

Preparation Method: None Instrument ID: 40HG4

Concentration Units: mg/kg

| Analyte | PQL | IDL | IDL Date |
|---|---|---|---|
| Mercury | 0.020 | 0.020 | 11/04/2011 |

FORM IX INORGANIC-2
METHOD DETECTION LIMITS

Lab Name: Pace Analytical - Green Bay SDG No. : 40182297 Contract: 0777010 CUMBERLAND FOSSIL PLAN

Preparation Method: Instrument ID: 40HG4

Concentration Units: mg/kg

| Analyte | PQL | MDL | MDL Date |
|---|---|---|---|
| Mercury | 0.020 | 0.0032 | 09/17/2018 |

# Sample listing "02252019A_40HG4_AJD.d80"



| Pos Nr | Samplename Remark | Amount Date | State Date | Height | Hg [ng] | Concentr. [mg/kg] | Σ | Cal-Factor | Calibration file Date | Method file Date |
|---|---|---|---|---|---|---|---|---|---|---|
| - 1 | PURGE 2-25-19 AJD | 0.0000 g 25 02 19 06 54 | ✔ B 25 02 19 06 54 | 0.0127 | 0.0000 | | | 1.0000 | 02112019CAL.c80 11 02 19 12 56 | |
| - 2 | PURGE 2-25-19 AJD | 0.0000 g 25 02 19 06 54 | ✔ B 25 02 19 06 58 | 0.0008 | 0.0000 | | | 1.0000 | 02112019CAL.c80 11 02 19 12 56 | |
| - 3 | PURGE 2-25-19 AJD 218610 7473-ICVB LOT NA EXP 25-FEB-19 | 0.0000 g 02 19 06 54 | ✔ B 25 02 19 07 03 | 0.0007 | 0.0000 | | | 1.0000 | 02112019CAL.c80 11 02 19 12 56 | |
| 1 4 | ICVB 218610_11393 101% | 0.0259 g 5 02 19 07 26 | ✔ 25 02 19 07 27 | 0.4054 | 7.8727 | 0.3040 | | 1.0000 | 02112019CAL.c80 11 02 19 12 56 | 7473 Biota.m80 31 10 11 13 06 |
| 1 5 | ICVA 218611_11393 100% 218611 7473-ICVA LOT NA EXP 25-FEB-19 | 0.0254 g 02 19 07 38 | ✔ 25 02 19 07 39 | 0.1149 | 126.6751 | 4.9872 | | 1.0000 | 02112019CAL.c80 11 02 19 12 56 | 7473 Biota.m80 31 10 11 13 06 |
| - 6 | auto BV (1) | 0.0000 g 5 02 19 07 48 | ✔ B 25 02 19 07 48 | 0.0318 | 0.0000 | | | 1.0000 | 02112019CAL.c80 11 02 19 12 56 | |
| 1 7 | ICB 218612_11393 <0 02 218612 7473-CALB LOT NA EXP 25-FEB-19 | 0.1000 g 25 02 19 07 52 | ✔ 25 02 19 07 53 | 0.0725 | 0.5780 | 0.0058 | | 1.0000 | 02112019CAL.c80 11 02 19 12 56 | 7473 Biota.m80 31 10 11 13 06 |
| 1 8 | CRDL 218615_11393 124% 218609 7473-CAL1 LOT NA EXP 25-FEB-19 | 0261 g 2 19 08 11 | ✔ 25 02 19 08 11 | 0.1686 | 2.5932 | 0.0994 | | 1.0000 | 02112019CAL.c80 11 02 19 12 56 | 7473 Biota.m80 31 10 11 13 06 |
| 1 9 | 1829518_11394 202021 <0 02 | .1000 g 25 02 19 08 23 | ✔ 25 02 19 08 25 | 0.1318 | 1.8139 | 0.0181 | | 1.0000 | 02112019CAL.c80 11 02 19 12 56 | 7473 Biota.m80 31 10 11 13 06 |
| 2 10 | 1829519_11394 218069 124% NR | 0.0490 g 25 02 19 08 36 | ✔ 25 02 19 08 38 | 0.7089 | 15.4960 | 0.3162 | | 1.0000 | 02112019CAL.c80 11 02 19 12 56 | 7473 Biota.m80 31 10 11 13 06 |
| 3 11 | 1829519_11394 218069 117% | 0.0490 g 25 02 19 08 49 | ✔ 25 02 19 08 49 | 0.6764 | 14.6215 | 0.2984 | | 1.0000 | 02112019CAL.c80 11 02 19 12 56 | 7473 Biota.m80 31 10 11 13 06 |
| 4 12 | 40182299001_11394 B | 0.1068 g 25 02 19 09 02 | ✔ 25 02 19 09 15 | 0.1401 | 1.9888 | 0.0186 | | 1.0000 | 02112019CAL.c80 11 02 19 12 56 | 7473 Biota.m80 31 10 11 13 06 |
| 5 13 | 1829520_11394 | 0.1067 g 25 02 19 09 03 | ✔ 25 02 19 09 25 | 0.7728 | 17.2618 | 0.1618 | | 1.0000 | 02112019CAL.c80 11 02 19 12 56 | 7473 Biota.m80 31 10 11 13 06 |
| 6 14 | 1829521_11394 | 0.1068 g 25 02 19 09 05 | ✔ 25 02 19 09 36 | 0.7911 | 17.7820 | 0.1665 | | 1.0000 | 02112019CAL.c80 11 02 19 12 56 | 7473 Biota.m80 31 10 11 13 06 |
| 7 15 | 40182299002_11394 B | 0.1050 g 25 02 19 09 05 | ✔ 25 02 19 09 48 | 0.1183 | 1.5304 | 0.0146 | | 1.0000 | 02112019CAL.c80 11 02 19 12 56 | 7473 Biota.m80 31 10 11 13 06 |
| 8 16 | 40182299003_11394 B | 0.1069 g 25 02 19 09 07 | ✔ 25 02 19 09 59 | 0.1169 | 1.5007 | 0.0140 | | 1.0000 | 02112019CAL.c80 11 02 19 12 56 | 7473 Biota.m80 31 10 11 13 06 |
| 9 17 | 40182299004_11394 B | 0.1090 g 25 02 19 09 08 | ✔ 25 02 19 10 11 | 0.1484 | 2.1642 | 0.0199 | | 1.0000 | 02112019CAL.c80 11 02 19 12 56 | 7473 Biota.m80 31 10 11 13 06 |
| 10 18 | 40182299005_11394 B | 0.1018 g 25 02 19 09 09 | ✔ 25 02 19 10 22 | 0.1304 | 1.7844 | 0.0175 | | 1.0000 | 02112019CAL.c80 11 02 19 12 56 | 7473 Biota.m80 31 10 11 13 06 |
| 11 19 | CCVB 211955_11393 107% | 0.0274 g 25 02 19 09 10 | ✔ 25 02 19 10 33 | 0.4351 | 8.5704 | 0.3128 | | 1.0000 | 02112019CAL.c80 11 02 19 12 56 | 7473 Biota.m80 31 10 11 13 06 |
| 12 20 | CCVA 146935_11393 107% | 0.0273 g 25 02 19 09 12 | ✔ 25 02 19 10 45 | 0.1110 | 122.3157 | 4.4804 | | 1.0000 | 02112019CAL.c80 11 02 19 12 56 | 7473 Biota.m80 31 10 11 13 06 |
| - 21 | auto BV (1) | 0.0000 g 25 02 19 10 57 | ✔ B 25 02 19 10 56 | 0.0010 | 0.0000 | | | 1.0000 | 02112019CAL.c80 11 02 19 12 56 | |

Created by "Administrator"
26.02.2019 06:07:46

# Sample listing "02252019A_40HG4_AJD.d80"



| Pos Nr | Samplename Remark | Amount Date | State Date | Height | Hg [ng] | Concentr. [mg/kg] | Σ | Cal-Factor | Calibration file Date | Method file Date |
|---|---|---|---|---|---|---|---|---|---|---|
| 13 22 | CCB 218612_11393 <0.02 | 0.1000 g 25.02.19 09:15 | ✔ 25.02.19 11:00 | 0.0030 | 0.0000 | 0.0000 | | 1.0000 | 02112019CAL.c80 11.02.19 12:56 | 7473 Biota.m80 31.10.11 13:06 |
| 14 23 | 1829514_11392 202021 <0.02 | 0.1001 g 25.02.19 11:18 | ✔ 25.02.19 11:19 | 0.0139 | 0.0000 | 0.0000 | | 1.0000 | 02112019CAL.c80 11.02.19 12:56 | 7473 Biota.m80 31.10.11 13:06 |
| 15 24 | 1829515_11392 218069 123% NR | 0.0490 g 25.02.19 11:29 | ✔ 25.02.19 11:31 | 0.7000 | 15.2538 | 0.3113 | | 1.0000 | 02112019CAL.c80 11.02.19 12:56 | 7473 Biota.m80 31.10.11 13:06 |
| 16 25 | 1829515_11392 218069 111% | 0.0490 g 25.02.19 11:42 | ✔ 25.02.19 11:43 | 0.6538 | 14.0218 | 0.2862 | | 1.0000 | 02112019CAL.c80 11.02.19 12:56 | 7473 Biota.m80 31.10.11 13:06 |
| 17 26 | 40182297003_11392 | 0.1004 g 25.02.19 11:55 | ✔ 25.02.19 12:37 | 0.0655 | 0.4344 | 0.0043 | | 1.0000 | 02112019CAL.c80 11.02.19 12:56 | 7473 Biota.m80 31.10.11 13:06 |
| 18 27 | 1829516_11392 | 0.1007 g 25.02.19 11:57 | ✔ 25.02.19 12:47 | 0.7449 | 16.4826 | 0.1637 | | 1.0000 | 02112019CAL.c80 11.02.19 12:56 | 7473 Biota.m80 31.10.11 13:06 |
| 19 28 | 1829517_11392 | 0.1007 g 25.02.19 11:59 | ✔ 25.02.19 12:58 | 0.7521 | 16.6832 | 0.1657 | | 1.0000 | 02112019CAL.c80 11.02.19 12:56 | 7473 Biota.m80 31.10.11 13:06 |
| 20 29 | 40182297001_11392 | 0.1003 g 25.02.19 12:00 | ✔ 25.02.19 13:10 | 0.0448 | 0.0099 | 0.0001 | | 1.0000 | 02112019CAL.c80 11.02.19 12:56 | 7473 Biota.m80 31.10.11 13:06 |
| 21 30 | 40182297002_11392 | 0.1093 g 25.02.19 12:05 | ✔ 25.02.19 13:21 | 0.0708 | 0.5435 | 0.0050 | | 1.0000 | 02112019CAL.c80 11.02.19 12:56 | 7473 Biota.m80 31.10.11 13:06 |
| 22 31 | 40182297004_11392 | 0.1062 g 25.02.19 12:05 | ✔ 25.02.19 13:32 | 0.0638 | 0.3994 | 0.0038 | | 1.0000 | 02112019CAL.c80 11.02.19 12:56 | 7473 Biota.m80 31.10.11 13:06 |
| 23 32 | 40182297005_11392 | 0.1071 g 25.02.19 12:06 | ✔ 25.02.19 13:44 | 0.0450 | 0.0140 | 0.0001 | | 1.0000 | 02112019CAL.c80 11.02.19 12:56 | 7473 Biota.m80 31.10.11 13:06 |
| 24 33 | CCVB 211955_11393 105% | 0.0276 g 25.02.19 12:10 | ✔ 25.02.19 13:55 | 0.4305 | 8.4625 | 0.3066 | | 1.0000 | 02112019CAL.c80 11.02.19 12:56 | 7473 Biota.m80 31.10.11 13:06 |
| 25 34 | CCVA 146935_11393 106% | 0.0271 g 25.02.19 12:11 | ✔ 25.02.19 14:07 | 0.1112 | 122.5393 | 4.5217 | | 1.0000 | 02112019CAL.c80 11.02.19 12:56 | 7473 Biota.m80 31.10.11 13:06 |
| - 35 | auto BV (1) | 0.0000 g 25.02.19 14:19 | ✔ B 25.02.19 14:18 | 0.0010 | 0.0000 | | | 1.0000 | 02112019CAL.c80 11.02.19 12:56 | |
| 26 36 | CCB 218612_11393 <0.02 | 0.1000 g 25.02.19 12:13 | ✔ 25.02.19 14:22 | 0.0017 | 0.0000 | 0.0000 | | 1.0000 | 02112019CAL.c80 11.02.19 12:56 | 7473 Biota.m80 31.10.11 13:06 |
| 27 37 | 40182297006_11392 | 0.1000 g 25.02.19 12:13 | ✔ 25.02.19 14:33 | 0.0320 | 0.0000 | 0.0000 | | 1.0000 | 02112019CAL.c80 11.02.19 12:56 | 7473 Biota.m80 31.10.11 13:06 |
| 28 38 | 40182297007_11392 | 0.1036 g 25.02.19 12:15 | ✔ 25.02.19 14:44 | 0.0600 | 0.3213 | 0.0031 | | 1.0000 | 02112019CAL.c80 11.02.19 12:56 | 7473 Biota.m80 31.10.11 13:06 |
| 29 39 | 40182297008_11392 | 0.1048 g 25.02.19 12:15 | ✔ 25.02.19 14:56 | 0.0516 | 0.1490 | 0.0014 | | 1.0000 | 02112019CAL.c80 11.02.19 12:56 | 7473 Biota.m80 31.10.11 13:06 |
| 30 40 | 40182297009_11392 | 0.1073 g 25.02.19 12:17 | ✔ 25.02.19 15:07 | 0.0618 | 0.3583 | 0.0033 | | 1.0000 | 02112019CAL.c80 11.02.19 12:56 | 7473 Biota.m80 31.10.11 13:06 |
| 31 41 | 40182297010_11392 | 0.1017 g 25.02.19 12:18 | ✔ 25.02.19 15:18 | 0.0370 | 0.0000 | 0.0000 | | 1.0000 | 02112019CAL.c80 11.02.19 12:56 | 7473 Biota.m80 31.10.11 13:06 |
| 32 42 | 40182297011_11392 | 0.1030 g 25.02.19 12:19 | ✔ 25.02.19 15:30 | 0.0740 | 0.6088 | 0.0059 | | 1.0000 | 02112019CAL.c80 11.02.19 12:56 | 7473 Biota.m80 31.10.11 13:06 |

Created by "Administrator"
26.02.2019 06:07:46

# Sample listing "02252019A_40HG4_AJD.d80"



Created by "Administrator"
26.02.2019 06:07:46

| Pos Nr | Samplename Remark | Amount Date | State Date | Height | Hg [ng] | Concentr. [mg/kg] | Σ | Cal-Factor | Calibration file Date | Method file Date |
|---|---|---|---|---|---|---|---|---|---|---|
| 33 43 | 40182297012_11392 | 0.1067 g 25.02.19 12:19 | ✔ 25.02.19 15:41 | 0.0672 | 0.4693 | 0.0044 | | 1.0000 | 02112019CAL.c80 11.02.19 12:56 | 7473 Biota.m80 31.10.11 13:06 |
| 34 44 | 40182297013_11392 | 0.1055 g 25.02.19 12:20 | ✔ 25.02.19 15:53 | 0.1113 | 1.3840 | 0.0131 | | 1.0000 | 02112019CAL.c80 11.02.19 12:56 | 7473 Biota.m80 31.10.11 13:06 |
| 35 45 | 40182297014_11392 | 0.1010 g 25.02.19 12:21 | ✔ 25.02.19 16:04 | 0.0715 | 0.5579 | 0.0055 | | 1.0000 | 02112019CAL.c80 11.02.19 12:56 | 7473 Biota.m80 31.10.11 13:06 |
| 36 46 | 40182297015_11392 | 0.1070 g 25.02.19 12:23 | ✔ 25.02.19 16:16 | 0.0916 | 0.9737 | 0.0091 | | 1.0000 | 02112019CAL.c80 11.02.19 12:56 | 7473 Biota.m80 31.10.11 13:06 |
| 37 47 | CCVB 211955_11393 104% | 0.0274 g 25.02.19 12:24 | ✔ 25.02.19 16:27 | 0.4238 | 8.3036 | 0.3031 | | 1.0000 | 02112019CAL.c80 11.02.19 12:56 | 7473 Biota.m80 31.10.11 13:06 |
| 38 48 | CCVA 146935_11393 108% | 0.0272 g 25.02.19 12:25 | ✔ 25.02.19 16:38 | 0.1114 | 122.7628 | 4.5133 | | 1.0000 | 02112019CAL.c80 11.02.19 12:56 | 7473 Biota.m80 31.10.11 13:06 |
| - 49 | auto BV (1) | 0.0000 g 25.02.19 16:51 | ✔ B 25.02.19 16:50 | 0.0007 | 0.0000 | | | 1.0000 | 02112019CAL.c80 11.02.19 12:56 | |
| 39 50 | CCB 218612_11393 <0.02 | 0.1000 g 25.02.19 12:27 | ✔ 25.02.19 16:53 | 0.0021 | 0.0000 | 0.0000 | | 1.0000 | 02112019CAL.c80 11.02.19 12:56 | 7473 Biota.m80 31.10.11 13:06 |
| 40 51 | 40182297016_11392 | 0.1042 g 25.02.19 12:27 | ✔ 25.02.19 17:04 | 0.0370 | 0.0000 | 0.0000 | | 1.0000 | 02112019CAL.c80 11.02.19 12:56 | 7473 Biota.m80 31.10.11 13:06 |
| 1 52 | 40182297017_11392 | 0.1051 g 25.02.19 12:28 | ✔ 25.02.19 17:16 | 0.0711 | 0.5497 | 0.0052 | | 1.0000 | 02112019CAL.c80 11.02.19 12:56 | 7473 Biota.m80 31.10.11 13:06 |
| 2 53 | 40182297018_11392 | 0.1091 g 25.02.19 12:29 | ✔ 25.02.19 17:27 | 0.0639 | 0.4006 | 0.0037 | | 1.0000 | 02112019CAL.c80 11.02.19 12:56 | 7473 Biota.m80 31.10.11 13:06 |
| 3 54 | 40182297019_11392 | 0.1021 g 25.02.19 12:30 | ✔ 25.02.19 17:39 | 0.0712 | 0.5517 | 0.0054 | | 1.0000 | 02112019CAL.c80 11.02.19 12:56 | 7473 Biota.m80 31.10.11 13:06 |
| 4 55 | 40182297020_11392 | 0.1025 g 25.02.19 12:32 | ✔ 25.02.19 17:50 | 0.0570 | 0.2597 | 0.0025 | | 1.0000 | 02112019CAL.c80 11.02.19 12:56 | 7473 Biota.m80 31.10.11 13:06 |
| 5 56 | CCVB 211955_11393 105% | 0.0276 g 25.02.19 12:33 | ✔ 25.02.19 18:02 | 0.4321 | 8.4995 | 0.3080 | | 1.0000 | 02112019CAL.c80 11.02.19 12:56 | 7473 Biota.m80 31.10.11 13:06 |
| 6 57 | CCVA 146935_11393 102% | 0.0270 g 25.02.19 12:34 | ✔ 25.02.19 18:13 | 0.1052 | 115.8326 | 4.2901 | | 1.0000 | 02112019CAL.c80 11.02.19 12:56 | 7473 Biota.m80 31.10.11 13:06 |
| - 58 | auto BV (1) | 0.0000 g 25.02.19 18:25 | ✔ B 25.02.19 18:25 | 0.0008 | 0.0000 | | | 1.0000 | 02112019CAL.c80 11.02.19 12:56 | |
| 7 59 | CCB 218612_11393 <0.02 | 0.1000 g 25.02.19 12:37 | ✔ 25.02.19 18:28 | 0.0028 | 0.0000 | 0.0000 | | 1.0000 | 02112019CAL.c80 11.02.19 12:56 | 7473 Biota.m80 31.10.11 13:06 |

## C. WORK ORDER 40182299

ENVIRONMENTAL STANDARDS

# INORGANIC ANALYSIS SUPPORT DOCUMENTATION

| | | | |
|---|---|---|---|
| ESI project name: | TVA CUF EI | Reviewed by: | Danielle Coles |
| Sample Collection Dates: | 4/10/18, 4/17/18 | Approved by: | AP |
| Job Number: | 20188111.A000 | Completion Date: | 4/2019 |
| Project Manager: | AJC | | |
| Laboratory: | TestAmerica- Pittsburgh | | |

Applicable Sample No's ( X ) — Refer to Table 1 in the Quality Assurance Review

| Deliverable: | | | Sample No. | Lab Control No. |
|---|---|---|---|---|
| | CLP (Full) | ( ) | | |
| | Level IV (Full) | ( X ) | 40182299 | |
| | Limited | ( ) | | |
| | Other: | | | |

The following table indicates criteria that were examined, the identified problems, and support documentation attachments

| | Criteria Examined in Detail<br>Check (√) if Yes or Footnote Letter for Comments Below | | | | | Problems Identified<br>Check (√) if Yes or Footnote Letter for Comments Below | | | | | Support Documentation Attachments<br>Check (√) if Yes or Footnote Letter for Comments Below | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | 6020A | 7473 | ASTM D2974-87 | | | 6020A | 7473 | ASTM D2974-87 | | | 6020A | 7473 | ASTM D2974-87 | | |
| Holding Times | X | X | X | | | | | | | | | | | | |
| Blank Analysis Results | X | X | | | | X | X | | | | X | X | | | |
| Matrix Spike (Predigestion) Results | X | X | | | | | | | | | | | | | |
| Duplicate Analysis: ( ) Field ( X ) Lab | | | X | | | | | | | | | | | | |
| Quantitation of Results | X | X | | | | | | | | | | | | | |
| Detection Limit/Sensitivity | | | | | | | | | | | | | | | |
| Initial Calibrations | X | X | | | | | | | | | | | | | |
| Continuing Calibrations | X | X | | | | | | | | | | | | | |
| Laboratory Control Standard (LCS) | X | X | | | | X | | | | | X | | | | |
| ICP Linear Range Analysis | X | | | | | | | | | | | | | | |
| ICP Interference Checks | | | | | | | | | | | | | | | |
| ICP Serial Dilutions | X | | | | | | | | | | | | | | |
| ICP Post-Digestion Spike | X | | | | | | | | | | | | | | |
| GFAA Post Digestion Spikes | | | | | | | | | | | | | | | |
| GFAA Duplicate Injections | | | | | | | | | | | | | | | |
| ICP Multiple Exposures | X | | | | | | | | | | | | | | |
| GFAA Standard Additions | | | | | | | | | | | | | | | |
| CRDL Standards | X | X | | | | | | | | | | | | | |
| Condition on Receipt | X | X | | | | | | | | | | | | | |
| Percent Solids | X | X | | | | | | | | | | | | | |
| Others: ICPMS internal standards | X | | | | | | | | | | | | | | |

Comments: All results are acceptable unless otherwise qualified.

ENVIRONMENTAL STANDARDS

# BLANK ANALYSIS RESULTS FOR INORGANIC PARAMETERS

| | Blank Type | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | Method | | | | | | | | | |
| Matrix (Aq., S.) | ICB | CCB | Prep. | Trip | Equip | Field | Blank Sample Number | Contaminant | Concentration (µg/L, mg/L, mg/kg) | Qualification limit (5×) |
| Aq | X | | | | | | ICB 2/4/19 14:39 | thallium | 0.14 | 0.7 |
| | | | | | | | | | | |
| Aq | X | | | | | | ICB 2/25/19 | mercury | 0.0058 | 0.029 |
| Aq | | | X | | | | method blank | mercury | 0.018 | 0.09 |
| | | | | | | | | | | |
| Aq | | | | | X | | CUF-FH-LB-F-EB01-20180412 | arsenic | 0.567 | 2.835 |
| | | | | | | | | cadmium | 0.495 | 2.475 |
| | | | | | | | | copper | 5.213 | 26.065 |
| | | | | | | | CUF-FH-LB-F-EB01-20180510 | barium | 1.866 | 9.33 |

Aq = Aqueous; S = Solid

Notes:

Pace Analytical Services, LLC
1241 Bellevue Street - Suite 9
Green Bay, WI 54302
(920)469-2436

# ANALYTICAL RESULTS

Project: CUF FISH TISSUE EQUIP. BLANKS
Pace Project No.: 40168712

**Sample: CUF-FH-LB-F-EB01-20180412** **Lab ID: 40168712001** Collected: 04/12/18 08:00 Received: 05/08/18 09:45 Matrix: Tissue

***Results reported on a "wet-weight" basis***

| Parameters | Results | Units | PQL | MDL | DF | Prepared | Analyzed | CAS No. | Qual |
|---|---|---|---|---|---|---|---|---|---|
| **6020 MET ICPMS** | Analytical Method: EPA 6020 Preparation Method: EPA 3050B | | | | | | | | |
| Antimony | x5 <0.011 | mg/kg | 0.090 | 0.011 | 1 | 06/29/18 09:03 | 07/05/18 17:31 | 7440-36-0 | |
| Arsenic | 0.255 0.051J | mg/kg | 0.090 | 0.027 | 1 | 06/29/18 09:03 | 07/05/18 17:31 | 7440-38-2 | |
| Barium | <0.041 | mg/kg | 0.14 | 0.041 | 1 | 06/29/18 09:03 | 07/05/18 17:31 | 7440-39-3 | |
| Beryllium | <0.030 | mg/kg | 0.099 | 0.030 | 1 | 06/29/18 09:03 | 07/09/18 21:06 | 7440-41-7 | |
| Boron | <0.27 | mg/kg | 0.91 | 0.27 | 1 | 06/29/18 09:03 | 07/09/18 21:06 | 7440-42-8 | |
| Cadmium | .225 0.045J | mg/kg | 0.090 | 0.0090 | 1 | 06/29/18 09:03 | 07/05/18 17:31 | 7440-43-9 | |
| Calcium | <22.9 | mg/kg | 76.2 | 22.9 | 1 | 06/29/18 09:03 | 07/05/18 17:31 | 7440-70-2 | |
| Chromium | <0.080 | mg/kg | 0.27 | 0.080 | 1 | 06/29/18 09:03 | 07/05/18 17:31 | 7440-47-3 | |
| Cobalt | <0.0074 | mg/kg | 0.090 | 0.0074 | 1 | 06/29/18 09:03 | 07/05/18 17:31 | 7440-48-4 | |
| Copper | 2.35 0.47 | mg/kg | 0.37 | 0.11 | 1 | 06/29/18 09:03 | 07/05/18 17:31 | 7440-50-8 | |
| Lead | <0.011 | mg/kg | 0.090 | 0.011 | 1 | 06/29/18 09:03 | 07/05/18 17:31 | 7439-92-1 | |
| Lithium | <0.014 | mg/kg | 0.090 | 0.014 | 1 | 06/29/18 09:03 | 07/09/18 21:06 | 7439-93-2 | |
| Molybdenum | <0.032 | mg/kg | 0.11 | 0.032 | 1 | 06/29/18 09:03 | 07/06/18 18:11 | 7439-98-7 | |
| Nickel | <0.037 | mg/kg | 0.12 | 0.037 | 1 | 06/29/18 09:03 | 07/05/18 17:31 | 7440-02-0 | |
| Selenium | <0.046 | mg/kg | 0.15 | 0.046 | 1 | 06/29/18 09:03 | 07/05/18 17:31 | 7782-49-2 | |
| Silver | <0.016 | mg/kg | 0.054 | 0.016 | 1 | 06/29/18 09:03 | 07/05/18 17:31 | 7440-22-4 | |
| Strontium | <0.14 | mg/kg | 0.48 | 0.14 | 1 | 06/29/18 09:03 | 07/05/18 17:31 | 7440-24-6 | |
| Thallium | <0.012 | mg/kg | 0.090 | 0.012 | 1 | 06/29/18 09:03 | 07/06/18 18:11 | 7440-28-0 | |
| Vanadium | <0.030 | mg/kg | 0.10 | 0.030 | 1 | 06/29/18 09:03 | 07/05/18 17:31 | 7440-62-2 | |
| Zinc | <1.6 | mg/kg | 5.2 | 1.6 | 1 | 06/29/18 09:03 | 07/05/18 17:31 | 7440-66-6 | |
| **7473 Mercury, Tissue** | Analytical Method: EPA 7473 | | | | | | | | |
| Mercury | <0.0031 | mg/kg | 0.020 | 0.0031 | 1 | | 06/07/18 09:53 | 7439-97-6 | H3 |

See below for qualifiers

raw data results

arsenic 0.567 x5 = 2.835 U*BE: 1,2,3
cadmium 0.495 x5 = 2.475 U*BE: 1,2,3,4,5
copper 5.213 x5 = 26.07 U*BE: 2,3,4,5

## REPORT OF LABORATORY ANALYSIS

This report shall not be reproduced, except in full,
without the written consent of Pace Analytical Services, LLC.

FORM II INORGANIC-1

CRDL CHECK STANDARD

Lab Name: Pace Analytical - Green Bay SDG No. : 40182299 Contract: 0777010 CUMBERLAND FOSSIL PLAN

CRDL Check Standard Source: 217187 Analysis Date/Time: 02/05/2019 15:35 ✓

Concentration Units: ug/L

70-130%

| Analyte | CRDL Check Standard | | | |
|---|---|---|---|---|
| | True | Found | %R | Control Limit %R |
| Boron | 5.0 | 4.4 ✓ | 88.1 | 70-130 |
| Calcium | ~~250~~ 500 | 520 | ~~208.0~~ 104.0 | 70-130 |
| Copper | ~~1.0~~ 5.0 | 5.1 | ~~507.0~~ 101.4 | 70-130 |
| Strontium | ~~1.0~~ 5.0 | 5.0 | ~~497.0~~ 99.4 | 70-130 |
| Zinc | 5.0 DC 3/15/19 | 5.9 ✓ | 117.1 DC 3/15/19 | 70-130 |

✓

*issue indicated in the case narrative

02/15/2019 15:37

FORM II INORGANIC-1
CRDL CHECK STANDARD

Lab Name: Pace Analytical - Green Bay SDG No. : 40182296 Contract: 0777010 CUMBERLAND FOSSIL PLAN

CRDL Check Standard Source: 217187 Analysis Date/Time: 02/05/2019 20:17 ✓

Concentration Units: ug/L

70-130%

| Analyte | CRDL Check Standard | | | |
|---|---|---|---|---|
| | True | Found | %R | Control Limit %R |
| Boron | 5.0 | 4.4 ✓ | 87.5 ✓ | 70-130 |
| Calcium | ~~250~~ 500 | 555 | ~~222.0~~ 111.0 | 70-130 |
| Copper | ~~1.0~~ 5.0 | 4.8 | ~~482.7~~ 96.5 | 70-130 |
| Strontium | ~~1.0~~ 5.0 | 5.0 ✓ | ~~499.7~~ 99.9 | 70-130 |
| Zinc | 5.0 DC 3/14/19 | 5.3 | 105.8 DC 3/14/19 ✓ | 70-130 |

* Issue indicated in the case narrative

FORM II INORGANIC-1
CRDL CHECK STANDARD

Lab Name: Pace Analytical - Green Bay SDG No. : 40182299 Contract: 0777010 CUMBERLAND FOSSIL PLAN

CRDL Check Standard Source: 217187 Analysis Date/Time: 02/05/2019 20:17

Concentration Units: ug/L

70-130%.

| Analyte | CRDL Check Standard | | | |
|---|---|---|---|---|
| | True | Found | %R | Control Limit %R |
| Boron | 5.0 | 4.4 | 87.5 | 70-130 |
| Calcium | ~~250~~ 500 | 555 | ~~222.0~~ 111.0 | 70-130 |
| Copper | ~~1.0~~ 5.0 | 4.8 | ~~482.7~~ 96.5 | 70-130 |
| Strontium | ~~1.0~~ 5.0 | 5.0 | ~~499.7~~ 99.9 | 70-130 |
| Zinc | 5.0 Dec mill | 5.3 | 105.8 per mg/m | 70-130 |

*issue indicated in case narrative

FORM II INORGANIC-1

CRDL CHECK STANDARD

Lab Name: Pace Analytical - Green Bay SDG No. : 40182299 Contract: 0777010 CUMBERLAND FOSSIL PLAN

CRDL Check Standard Source: 217187 Analysis Date/Time: 02/05/2019 21:56 ✓

Concentration Units: ug/L

70-130%

| Analyte | CRDL Check Standard | | | |
|---|---|---|---|---|
| | True | Found | %R | Control Limit %R |
| Boron | 5.0 | 5.2 | 105.0 | 70-130 |
| Calcium | ~~250~~ 500 | 503 | ~~201.1~~ 100.6 | 70-130 |
| Copper | ~~1.0~~ 5.0 | 5.1 | ~~509.1~~ 101.8 | 70-130 |
| Strontium | ~~1.0~~ 5.0 | 5.0 | ~~496.3~~ 99.3 | 70-130 |
| Zinc | 5.0 DC3/15/19 | 5.1 | 102.3 ✓ DC3/16/19 | 70-130 |

* issue indicated in case narrative

FORM II INORGANIC-1

CRDL CHECK STANDARD

Lab Name: Pace Analytical - Green Bay SDG No. : 40182299 Contract: 0777010 CUMBERLAND FOSSIL PLAN

CRDL Check Standard Source: 217187 Analysis Date/Time: 02/06/2019 00:55 ✓

Concentration Units: ug/L

70-130 %

| Analyte | CRDL Check Standard | | | |
|---|---|---|---|---|
| | True | Found | %R | Control Limit %R |
| Boron | 5.0 | 4.5 ✓ | 90.1 | 70-130 |
| Calcium | ~~250~~ 500 | 522 | ~~209.0~~ 104.5 | 70-130 |
| Copper | ~~1.0~~ 5.0 | 5.0 | ~~487.2~~ 97.4 | 70-130 |
| Strontium | ~~1.0~~ 5.0 | 5.0 | ~~500.6~~ 100.1 | 70-130 |
| Zinc | 5.0 DC 3/15/19 | 4.4 ✓ | 87.4 DC 3/15/19 ✓ | 70-130 |

* issue indicated in case narrative

FORM II INORGANIC-1

CRDL CHECK STANDARD

Lab Name: Pace Analytical - Green Bay SDG No. : 40182299 Contract: 0777010 CUMBERLAND FOSSIL PLAN

CRDL Check Standard Source: 217384 Analysis Date/Time: 02/06/2019 16:39

Concentration Units: ug/L

70-130%

| Analyte | CRDL Check Standard | | | |
|---|---|---|---|---|
| | True | Found | %R | Control Limit %R |
| Boron | 5.0 | 5.0 | 100.3 | 70-130 |
| Calcium | ~~250~~ 500 | 529 | ~~211.8~~ 105.9 | 70-130 |
| Copper | ~~1.0~~ 5.0 | 5.3 | ~~527.2~~ 105.4 | 70-130 |
| Strontium | ~~1.0~~ 5.0 | 5.2 | ~~521.6~~ 104.3 | 70-130 |
| Zinc | 5.0 DW 3/15/19 | 4.9 | 97.8 DW 3/15/19 | 70-130 |

* issue indicated in case narrative

FORM II INORGANIC-1

CRDL CHECK STANDARD

Lab Name: Pace Analytical - Green Bay SDG No. : 40182299 Contract: 0777010 CUMBERLAND FOSSIL PLAN

CRDL Check Standard Source: 217384 Analysis Date/Time: 02/06/2019 18:16 ✓

Concentration Units: ug/L

70-130%

| Analyte | CRDL Check Standard | | | |
|---|---|---|---|---|
| | True | Found | %R | Control Limit %R |
| Boron | 5.0 | 4.7 | 94.8 ✓ | 70-130 |
| Calcium | ~~250~~ 500 | 484 ✓ | ~~193.6~~ 96.8 | 70-130 |
| Copper | ~~1.0~~ 5.0 | 5.2 ✓ | ~~520.5~~ 104.1 | 70-130 |
| Strontium | ~~1.0~~ 5.0 | 5.2 | ~~520.3~~ 104.1 | 70-130 |
| Zinc | 5.0 DE 3/15/19 | 5.1 | 101.0 DE 3/15/19 ✓ | 70-130 |

*issue indicated in case narrative

FORM III INORGANIC-1
BLANKS

Lab Name: Pace Analytical - Green Bay SDG No. : 40182299 Contract : 0777010 CUMBERLAND FOSSIL PLAN

Method Blank Matrix: Tissue Instrument ID: 40ICM2

Method Blank Concentration Units: mg/kg

| Analyte | Initial Calibration Blank (ug/L) | | Continuing Calibration Blank (ug/L) | | | | | | Method Blank | |
|---|---|---|---|---|---|---|---|---|---|---|
| | 02/04/2019 14:39 ✓ | C | 02/04/2019 15:21 ✓ | C | 02/04/2019 16:36 ✓ | C | 02/04/2019 17:52 ✓ | C | 1821931 | C |
| Antimony | 0.16 | U | 0.16 | U | 0.16 | U | 0.16 | U | <0.016 | U |
| Barium | 0.38 | U | 0.38 | U | 0.38 | U | 0.38 | U | <0.031 | U |
| Cadmium | 0.10 | U | 0.10 | U | 0.10 | U | 0.10 | U | <0.014 | U |
| Lead | 0.29 | U | 0.29 | U | 0.29 | U | 0.29 | U | <0.026 | U |
| Molybdenum | 0.13 | U | 0.13 | U | 0.13 | U | 0.13 | U | <0.036 | U |
| Silver | 0.014 | U | -0.027 | | -0.014 | | -0.016 | | <0.011 | U |
| Thallium | 0.14 | | 0.11 | U | 0.11 | U | 0.11 | U | <0.013 | U |

0.14 mg/L x 5 = 0.7 µg/L

U, BL: 2.4

<|2x IDL|, no qual for negative bias

Clear

SAMPLE NO.

1821933SRM

FORM VII INORGANIC-1
LABORATORY CONTROL SAMPLE

Lab Name: Pace Analytical - Green Bay SDG No. : 40182299 Contract: 0777010 CUMBERLAND

Matrix: Tissue

80-120%.

| Analyte | Units | True | Found | %R | Limits | |
|---|---|---|---|---|---|---|
| Arsenic | mg/kg | 59.5 | 69.4 | 117 | 80 | 126 |
| Cadmium | mg/kg | 42.3 | 42.5 | 100 | 80 | 120 |
| Chromium | mg/kg | 2.0 | 1.0 | 53 | 13 | 93 |
| Cobalt | mg/kg | 1.1 | 1.1 | 102 | 80 | 120 |
| Copper | mg/kg | 497 | 409 | 82 | 77 | 120 |
| Lead | mg/kg | 0.22 | 0.21 | 92 | 79 | 120 |
| Molybdenum | mg/kg | 3.4 | 3.2 | 92 | 80 | 120 |
| Nickel | mg/kg | 5.3 | 4.5 | 86 | 76 | 120 |
| Selenium | mg/kg | 10.9 | 12.6 | 115 | 80 | 130 |
| Strontium | mg/kg | 36.5 | 29.8 | 82 | 79 | 120 |
| Vanadium | mg/kg | 9.1 | 9.1 | 100 | 80 | 120 |
| Zinc | mg/kg | 136 | 134 | 99 | 80 | 120 |

J/UJ, L-: all samples

FORM III INORGANIC-1

BLANKS

Lab Name: Pace Analytical - Green Bay SDG No. : 40182299 Contract : 0777010 CUMBERLAND FOSSIL PLAN

Method Blank Matrix: Tissue Instrument ID: 40HG4

Method Blank Concentration Units: mg/kg

| Analyte | Initial Calibration Blank (mg/kg) | | Continuing Calibration Blank (mg/kg) | | | | | | Method Blank | |
|---|---|---|---|---|---|---|---|---|---|---|
| | 02/25/2019 07:53 ✓ | C | 02/25/2019 11:00 ✓ | C | | C | | C | 1829518 | C |
| Mercury | 0.020 | U | 0.020 | U | | | | | 0.018 | J |
| | 0.0058 | | Clear | | | | | | | |

0.0058x5= 0.029mg/kg (0.5780ug x5 = 2.89) U*, BL: all samples

0.018x5= 0.09mg/kg (1.819x5= 9.0695ug) U*, BL: all samples

# SECTION 4

# CASE NARRATIVES AND CHAIN-OF-CUSTODY RECORDS

Pace Analytical Services, LLC
1241 Bellevue Street - Suite 9
Green Bay, WI 54302
(920)469-2436

## SAMPLE SUMMARY

Project: 0777010 CUMBERLAND FOSSIL PLAN
Pace Project No.: 40182296

| Lab ID | Sample ID | Matrix | Date Collected | Date Received |
|---|---|---|---|---|
| 40182296001 | CUF-FH-BG-CURD-F-20180509 | Tissue | 05/09/18 17:50 | 01/17/19 08:55 |
| 40182296002 | CUF-FH-BG-CURA-F-20180509 | Tissue | 05/09/18 14:17 | 01/17/19 08:55 |
| 40182296003 | CUF-FH-BG-CURU-F-20180509 | Tissue | 05/09/18 11:20 | 01/17/19 08:55 |
| 40182296004 | CUF-FH-BG-WCD-F-20180510 | Tissue | 05/10/18 10:18 | 01/17/19 08:55 |
| 40182296005 | CUF-FH-BG-WCU-F-20180508 | Tissue | 05/08/18 18:08 | 01/17/19 08:55 |
| 40182296006 | CUF-FH-CC-CURD-F-20180509 | Tissue | 05/09/18 17:50 | 01/17/19 08:55 |
| 40182296007 | CUF-FH-CC-CURA-F-20180509 | Tissue | 05/09/18 14:17 | 01/17/19 08:55 |
| 40182296008 | CUF-FH-CC-CURU-F-20180502 | Tissue | 05/02/18 13:00 | 01/17/19 08:55 |
| 40182296009 | CUF-FH-CC-WCD-F-20180410 | Tissue | 04/10/18 17:15 | 01/17/19 08:55 |
| 40182296010 | CUF-FH-CC-WCU-F-20180410 | Tissue | 04/10/18 15:30 | 01/17/19 08:55 |
| 40182296011 | CUF-FH-LB-CURD-F-20180410 | Tissue | 04/10/18 13:25 | 01/17/19 08:55 |
| 40182296012 | CUF-FH-LB-CURA-F-20180410 | Tissue | 04/10/18 11:15 | 01/17/19 08:55 |
| 40182296013 | CUF-FH-LB-CURU-F-20180509 | Tissue | 05/09/18 11:20 | 01/17/19 08:55 |
| 40182296014 | CUF-FH-LB-WCD-F-20180410 | Tissue | 04/10/18 17:15 | 01/17/19 08:55 |
| 40182296015 | CUF-FH-LB-WCU-F-20180410 | Tissue | 04/10/18 15:30 | 01/17/19 08:55 |
| 40182296016 | CUF-FH-RS-CURD-F-20180509 | Tissue | 05/09/18 17:50 | 01/17/19 08:55 |
| 40182296017 | CUF-FH-RS-CURA-F-20180501 | Tissue | 05/01/18 10:30 | 01/17/19 08:55 |
| 40182296018 | CUF-FH-RS-CURU-F-20180502 | Tissue | 05/02/18 13:00 | 01/17/19 08:55 |
| 40182296019 | CUF-FH-RS-WCD-F-20180510 | Tissue | 05/10/18 10:18 | 01/17/19 08:55 |
| 40182296020 | CUF-FH-RS-WCU-F-20180501 | Tissue | 05/01/18 16:40 | 01/17/19 08:55 |
| 40182296021 | 40182296-021 RINSE BLANK | Tissue | | 01/24/19 13:03 |



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# PROJECT NARRATIVE

Project: 0777010 CUMBERLAND FOSSIL PLAN
Pace Project No.: 40182296

**Method:** **EPA 6020**
**Description:** 6020 MET ICPMS
**Client:** TENNESSEE VALLEY AUTHORITY
**Date:** February 26, 2019

**General Information:**
21 samples were analyzed for EPA 6020. All samples were received in acceptable condition with any exceptions noted below or on the chain-of custody and/or the sample condition upon receipt form (SCUR) attached at the end of this report.

**Hold Time:**
The samples were analyzed within the method required hold times with any exceptions noted below.

**Sample Preparation:**
The samples were prepared in accordance with EPA 3050B with any exceptions noted below.

**Initial Calibrations (including MS Tune as applicable):**
All criteria were within method requirements with any exceptions noted below.

**Continuing Calibration:**
All criteria were within method requirements with any exceptions noted below.

**Internal Standards:**
All internal standards were within QC limits with any exceptions noted below.

**Method Blank:**
All analytes were below the report limit in the method blank, where applicable, with any exceptions noted below.

**Laboratory Control Spike:**
All laboratory control spike compounds were within QC limits with any exceptions noted below.

**Matrix Spikes:**
All percent recoveries and relative percent differences (RPDs) were within acceptance criteria with any exceptions noted below.

**Additional Comments:**



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# PROJECT NARRATIVE

Project: 0777010 CUMBERLAND FOSSIL PLAN
Pace Project No.: 40182296

**Method:** **EPA 7473**
**Description:** 7473 Mercury, Tissue
**Client:** TENNESSEE VALLEY AUTHORITY
**Date:** February 26, 2019

**General Information:**
21 samples were analyzed for EPA 7473. All samples were received in acceptable condition with any exceptions noted below or on the chain-of custody and/or the sample condition upon receipt form (SCUR) attached at the end of this report.

**Hold Time:**
The samples were analyzed within the method required hold times with any exceptions noted below.

**Initial Calibrations (including MS Tune as applicable):**
All criteria were within method requirements with any exceptions noted below.

**Continuing Calibration:**
All criteria were within method requirements with any exceptions noted below.

**Method Blank:**
All analytes were below the report limit in the method blank, where applicable, with any exceptions noted below.

QC Batch: 313674

B: Analyte was detected in the associated method blank.
- BLANK for HBN 313674 [MERC/113 (Lab ID: 1827327)
  - Mercury

**Laboratory Control Spike:**
All laboratory control spike compounds were within QC limits with any exceptions noted below.

**Matrix Spikes:**
All percent recoveries and relative percent differences (RPDs) were within acceptance criteria with any exceptions noted below.

**Additional Comments:**

Analyte Comments:

QC Batch: 313674

E: Analyte concentration exceeded the calibration range. The reported result is estimated.
- CUF-FH-CC-CURA-F-20180509 (Lab ID: 40182296007)
  - Mercury
- CUF-FH-CC-WCD-F-20180410 (Lab ID: 40182296009)
  - Mercury
- CUF-FH-CC-WCU-F-20180410 (Lab ID: 40182296010)
  - Mercury
- CUF-FH-RS-WCU-F-20180501 (Lab ID: 40182296020)
  - Mercury

DC3/MLM
J, C



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# PROJECT NARRATIVE

Project: 0777010 CUMBERLAND FOSSIL PLAN
Pace Project No.: 40182296

**Method:** **ASTM D2974-87**
**Description:** Percent Moisture Reportable
**Client:** TENNESSEE VALLEY AUTHORITY
**Date:** February 26, 2019

**General Information:**
20 samples were analyzed for ASTM D2974-87. All samples were received in acceptable condition with any exceptions noted below or on the chain-of custody and/or the sample condition upon receipt form (SCUR) attached at the end of this report.

**Hold Time:**
The samples were analyzed within the method required hold times with any exceptions noted below.

**Initial Calibrations (including MS Tune as applicable):**
All criteria were within method requirements with any exceptions noted below.

**Continuing Calibration:**
All criteria were within method requirements with any exceptions noted below.

**Internal Standards:**
All internal standards were within QC limits with any exceptions noted below.

**Surrogates:**
All surrogates were within QC limits with any exceptions noted below.

**Method Blank:**
All analytes were below the report limit in the method blank, where applicable, with any exceptions noted below.

**Laboratory Control Spike:**
All laboratory control spike compounds were within QC limits with any exceptions noted below.

**Matrix Spikes:**
All percent recoveries and relative percent differences (RPDs) were within acceptance criteria with any exceptions noted below.

**Duplicate Sample:**
All duplicate sample results were within method acceptance criteria with any exceptions noted below.

**Additional Comments:**

This data package has been reviewed for quality and completeness and is approved for release.



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# CASE NARRATIVE - METALS ANALYSIS

**Lab Report Number (SDG):** 40182296
**Client:** TENNESSEE VALLEY AUTHORITY
**Project Name:** CUMBERLAND FOSSIL PLANT
**Project Number:** 0777010

## 1. RECEIPT

Samples were received frozen on dry ice and kept frozen at less than -10°C until time of preparation. Sample 40182296-021 RINSE BLANK was generated in the laboratory by rinsing the equipment used to stir the tissue samples with deionized water.

## 2. HOLDING TIMES

A. **Sample Preparation:** The samples, with the exception of 40182296-021 RINSE BLANK, were kept frozen prior to analysis, therefore the sample hold-time criteria is not applicable.

B. **Sample Analysis:** All method required holding times were met.

## 3. METHOD

**Preparation:** SW846 3050B, 7473
**Analysis:** SW846 6020A, 7473

## 4. PREPARATION

Sample preparation proceeded normally. Although sample 40182296-021 RINSE BLANK consists of deionized water, the sample was prepared in a manner consistent with the other tissue samples in this SDG (i.e., as if it were a tissue sample).

## 5. ANALYSIS

A. **Calibration:**

1. **Initial verification:** All method acceptance criteria were met.
2. **Continuing verification:** All method acceptance criteria were met.
3. **Reporting limit verification (CRDL):** All method acceptance criteria were met. Due to software limitations, the percent recoveries for Calcium, Copper, and Strontium are based on the water reporting limits rather than the tissue reporting limits and appear to recover two (Ca) and five (Cu, Sr) times higher than the true value.

B. **Blanks:**

1. **Initial calibration:** All method acceptance criteria were met.
2. **Continuing calibration:** All method acceptance criteria were met.
3. **Method:** All project specific acceptance criteria were met. Mercury (7473) was detected in the method blank above the laboratory method detection limit (MDL) but below the laboratory reporting limit (PQL). All associated sample results greater than the MDL but less than ten times the blank values were reported with the "B" data qualifier.
4. **Chicken:** A chicken blank is prepared and analyzed with each sample batch to determine the background contamination levels of the chicken used for the laboratory control spike (LCS). The chicken blank is analyzed down to the laboratory MDL. Calcium, Chromium, Copper, Molybdenum, Nickel, Selenium, and Zinc were detected at levels above the MDL in chicken blank 1821380. Calcium, Copper, Selenium, and Zinc were detected at levels above the MDL in chicken blank 1821932. The chicken blank results for these analytes were subtracted from the associated LCS results prior to calculating the percent recoveries of the spike.

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C. **Spikes:**
   1. **Lab Control Spike (LCS):** The associated LCS met all in-house accuracy criteria.
   2. **SRM:** A Standard Reference Material was analyzed with each analytical batch. The in-house accuracy criteria were met.
   3. **Matrix Spike / Duplicate (MS/MSD):** Sample CUF-FH-BG-CURD-F-20180509 was designated as the 6020A and 7473 matrix spike sample for this SDG. All in-house accuracy and precision criteria were met. Batch QC was also analyzed with the 6020A portion of this SDG.

D. **Sample Duplicates:** Not applicable.

E. **Internal Standards:** All in-house acceptance criteria were met for the internal standards used for quantification.

F. **ICPMS Interference Check Samples:** All acceptance criteria were met.

G. **ICPMS Serial Dilution:** All applicable acceptance criteria were met. Serial dilution % Difference is not evaluated for parent results less than fifty times the water reporting limit.

H. **Samples:** Sample analyses proceeded normally.

I. **Dilutions:** None required for this SDG.

J. **Reanalysis:** None required for this SDG.

K. **Comments:** Samples were reported on a wet weight basis.
The Mercury result for samples CUF-FH-CC-CURA-F-20180509, CUF-FH-CC-WCD-F-20180410, CUF-FH-CC-WCU-F-20180410 and CUF-FH-RS-WCU-F-20180501 exceeded the lower calibration range and the "E" data qualifier was applied to the final report. ✓.

I certify that this data package is in compliance, with the terms and conditions agreed to by **Pace Analytical Services, LLC** and by the client, both technically and for completeness, except for the conditions detailed above. The Laboratory Manager or his designee, as verified by the following signature, has authorized release of the data contained in this completed data package:

Signed: Jill A. Duranceau Date: 02/26/19

Name: Jill A Duranceau Position: Quality Assurance Auditor

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# CASE NARRATIVE - GENERAL CHEMISTRY ANALYSIS

**Lab Report Number (SDG):** 40182296
**Client:** TENNESSEE VALLEY AUTHORITY
**Project Name:** CUMBERLAND FOSSIL PLANT
**Project Number:** 0777010

**1. RECEIPT**

Samples were received frozen on dry ice and kept frozen at less than -10°C until time of preparation.

**2. HOLDING TIMES**

A. **Sample Preparation:** The samples were kept frozen prior to analysis therefore the sample hold-time criteria is not applicable.

B. **Sample Analysis:** All method recommended holding times were met.

**3. METHOD**

A. **Preparation:** NA

B. **Analysis:** ASTM D2974-87

**4. PREPARATION**

Sample preparation proceeded normally.

**5. ANALYSIS**

A. **Blanks:**

1. **Method:** Not applicable to this SDG.

B. **Sample Duplicates:** Sample CUF-FH-LB-WCU-F-20180410 was designated as the parent sample for the duplicate analysis for the Percent Moisture. The in-house precision criteria were met.

C. **Samples:** Sample analyses proceeded normally.

D. **Dilutions:** Not applicable to this SDG.

E. **Reanalysis:** None required for this SDG.

F. **Comments:** No additional comments are needed.

I certify that this data package is in compliance with the terms and conditions agreed to by **Pace Analytical Services, LLC**, and by the client, both technically and for completeness, except for the conditions detailed above. The Laboratory Manager or his designee, as verified by the following signature, has authorized release of the data contained in this completed data package:

Signed: Leigh A Begalske Date: 02/21/19

Name: Leigh A. Begalske Position: Quality Assurance Auditor

40182296

## TVA Environmental Investigations

Tennessee Valley Authority

| COOLER No.: | 1 | of | 3 |
|---|---|---|---|
| COC No: | CUF_FH_20190117_1A | | |
| 1 of 6 Pages | | | |
| Task Desc: | CUF_FH | | |

### Chain-of-Custody / Analytical Request Document

**Chain-of-Custody is a LEGAL DOCUMENT. All relevant fields must be completed and accurate**

| Required Ship to Lab: | | Required Project Information: | | Required Sampler Information | |
|---|---|---|---|---|---|
| Lab Name: | Pace Green Bay | Site ID #: | Cumberland Fossil Plant | Sampler: Tyler Baker | |
| Lab Address: | 1241 Bellevue St | Project #: | 0777010 | Sampling Company: TVA | |
| | Suite 9 | Site Address | 815 Cumberland City Road | Address: TVA Chickamauga Power Service Center, 4601 N. Access Road | |
| | Green Bay, WI 54302 | City | Cumberland State, Zip: TN, 37763 | City/State: Chattanooga, TN | Phone: 423-876-6733 |
| Lab Manager Contact Information | | Site PM Name: | Roy Quinn | | |
| Lab PM: | Tod Noltemeyer | Phone/Fax: | 423-751-3753 | Sampling Team Number: | 1 |
| Phone/Fax: | 608-232-3300 | Site PM Email: | rquinn@tva.gov | Send EDD/Hard Copy to: | tva-ei@envsta.com |
| Lab Email: | Tod.Noltemeyer@pacelabs.com | | | | |

**Analysis Turnaround Time**

☐ CALENDAR DAYS ☑ WORKING DAYS

TAT if different from Below _____

☐ 24 Hours
☐ 3 Business Days
☐ 5 Business Days
☑ 10 Business Days (Standard)

| ITEMS # | SAMPLE ID Samples IDs MUST BE UNIQUE | SAMPLE LOCATION | Sample Depth: Depth Unit | Sample Depth: Feet (Start Depth) | Sample Depth: Feet (End Depth) | MATRIX CODE | G= GRAB C=COMP | SAMPLE TYPE | SAMPLE DATE | SAMPLE TIME | # OF CONTAINERS | Comments/ Lab Sample I.D. | MS/MSD | Analysis: Fish | Filtered: N | Preserve: see comments | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 | CUF-FH-BG-CURD-F-20180509 | CURD | | NA | NA | FH | C | N | 5/9/2018 | 1750 | 1 | | ☐ | X | | | 001 |
| 2 | CUF-FH-BG-CURA-F-20180509 | CURA | | NA | NA | FH | C | N | 5/9/2018 | 1417 | 1 | | ☐ | X | | | 002 |
| 3 | CUF-FH-BG-CURU-F-20180509 | CURU | | NA | NA | FH | C | N | 5/9/2018 | 1120 | 1 | | ☐ | X | | | 003 |
| 4 | CUF-FH-BG-WCD-F-20180510 | WCD | | NA | NA | FH | C | N | 5/10/2018 | 1018 | 1 | | ☐ | X | | | 004 |
| 5 | CUF-FH-BG-WCU-F-20180508 | WCU | | NA | NA | FH | C | N | 5/8/2018 | 1808 | 1 | | ☐ | X | | | 005 |
| 6 | CUF-FH-CC-CURD-F-20180509 | CURD | | NA | NA | FH | C | N | 5/9/2018 | 1750 | 1 | | ☐ | X | | | 006 |
| 7 | CUF-FH-CC-CURA-F-20180509 | CURA | | NA | NA | FH | C | N | 5/9/2018 | 1417 | 1 | | ☐ | X | | | 007 |
| 8 | CUF-FH-CC-CURU-F-20180502 | CURU | | NA | NA | FH | C | N | 5/2/2018 | 1300 | 1 | | ☐ | X | | | 008 |
| 9 | CUF-FH-CC-WCD-F-20180410 | WCD | | NA | NA | FH | C | N | 4/10/2018 | 1715 | 1 | | ☐ | X | | | 009 |
| 10 | CUF-FH-CC-WCU-F-20180410 | WCU | | NA | NA | FH | C | N | 4/10/2018 | 1530 | 1 | | ☐ | X | | | 010 |
| 11 | CUF-FH-LB-CURD-F-20180410 | CURD | | NA | NA | FH | C | N | 4/10/2018 | 1325 | 1 | | ☐ | X | | | 011 |
| 12 | CUF-FH-LB-CURA-F-20180410 | CURA | | NA | NA | FH | C | N | 4/10/2018 | 1115 | 1 | | ☐ | X | | | 012 |
| 13 | CUF-FH-LB-CURU-F-20180509 | CURU | | NA | NA | FH | C | N | 5/9/2018 | 1120 | 1 | | ☐ | X | | | 013 |

Additional Comments/Special Instructions:

| RELINQUISHED BY / AFFILIATION | DATE | TIME | ACCEPTED BY / AFFILIATION | DATE | TIME |
|---|---|---|---|---|---|
| Tyler Baker / TVA | 1-17-19 | 1310 | [illegible] | 1/18/19 | 1355 |

| Sample Receipt Conditions | | | |
|---|---|---|---|
| ☐ Yes ☐ No | ☑ Yes ☐ No | ☑ Yes ☐ No | ☐ Yes ☑ No |
| ☐ Yes ☐ No | ☐ Yes ☐ No | ☐ Yes ☐ No | ☐ Yes ☐ No |
| ☐ Yes ☐ No | ☐ Yes ☐ No | ☐ Yes ☐ No | ☐ Yes ☐ No |
| ☐ Yes ☐ No | ☐ Yes ☐ No | ☐ Yes ☐ No | ☐ Yes ☐ No |
| Temperature in °C | Sample on Ice? | Sample Intact? | Trip Blank? |

| SHIPPING METHOD: | SAMPLER NAME AND SIGNATURE |
|---|---|
| Fedex | Tyler Baker Tyler Baker |

Form TVA 30067A

40182296

# TVA Environmental Investigations

**Tennessee Valley Authority**

| | | | |
|---|---|---|---|
| COOLER No.: | 1 | of | 3 |
| COC No: | CUF_FH_20190117_1A | | |
| 2 of 6 Pages | | | |
| Task Desc: | CUF_FH | | |

## Chain-of-Custody / Analytical Request Document

**Chain-of-Custody is a LEGAL DOCUMENT. All relevant fields must be completed and accurate**

| Required Ship to Lab: | | Required Project Information: | | Required Sampler Information | |
|---|---|---|---|---|---|
| Lab Name: | Pace Green Bay | Site ID #: | Cumberland Fossil Plant | Sampler: Tyler Baker | |
| Lab Address: | 1241 Bellevue St | Project #: | 0777010 | Sampling Company: TVA | |
| | Suite 9 | Site Address | 815 Cumberland City Road | Address: TVA Chickamauga Power Service Center, 4601 N. Access Road | |
| | Green Bay, WI 54302 | City | Cumberland | State, Zip: TN, 37763 | City/State: Chattanooga, TN Phone: 423-876-6733 |
| Lab Manager Contact Information | | Site PM Name: | Roy Quinn | | |
| Lab PM: | Tod Noltemeyer | Phone/Fax: | 423-751-3753 | Sampling Team Number: | 1 |
| Phone/Fax: | 608-232-3300 | Site PM Email: | jrquinn@tva.gov | Send EDD/Hard Copy to: | tva-ei@envstd.com |
| Lab Email: | Tod.Noltemeyer@pacelabs.com | | | | |

**Analysis Turnaround Time**

☐ CALENDAR DAYS ☑ WORKING DAYS

TAT if different from Below _____

☐ 24 Hours
☐ 3 Business Days
☐ 5 Business Days
☑ 10 Business Days (Standard)

| ITEMS # | SAMPLE ID Samples IDs MUST BE UNIQUE | SAMPLE LOCATION | Sample Depth: Depth Unit | Sample Depth: Feet | MATRIX CODE | G= GRAB C=COMP | SAMPLE TYPE | SAMPLE DATE | SAMPLE TIME | # OF CONTAINERS | Comments/ Lab Sample I.D. | MS/MSD | Analysis: Fish | Filtered: N | Preserve: see comments |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 | CUF-FH-LB-WCD-F-20180410 | WCD | NA | NA | FH | C | N | 4/10/2018 | 1715 | 1 | 014 | ☐ | X | | |
| 2 | CUF-FH-LB-WCU-F-20180410 | WCU | NA | NA | FH | C | N | 4/10/2018 | 1530 | 1 | 015 | ☐ | X | | |
| 3 | CUF-FH-RS-CURD-F-20180509 | CURD | NA | NA | FH | C | N | 5/9/2018 | 1750 | 1 | 016 | ☐ | X | | |
| 4 | CUF-FH-RS-CURA-F-20180501 | CURA | NA | NA | FH | C | N | 5/1/2018 | 1030 | 1 | 017 | ☐ | X | | |
| 5 | CUF-FH-RS-CURU-F-20180502 | CURU | NA | NA | FH | C | N | 5/2/2018 | 1300 | 1 | 018 | ☐ | X | | |
| 6 | CUF-FH-RS-WCD-F-20180510 | WCD | NA | NA | FH | C | N | 5/10/2018 | 1018 | 1 | 019 | ☐ | X | | |
| 7 | CUF-FH-RS-WCU-F-20180501 | WCU | NA | NA | FH | C | N | 5/1/2018 | 1640 | 1 | 020 | ☐ | X | | |
| 8 | CUF-FH-BG-CURD-O-20180509 | CURD | NA | NA | FH | C | N | 5/9/2018 | 1750 | 1 | | ☐ | X | | |
| 9 | CUF-FH-BG-CURA-O-20180509 | CURA | NA | NA | FH | C | N | 5/9/2018 | 1417 | 1 | | ☐ | X | | |
| 10 | CUF-FH-BG-CURU-O-20180509 | CURU | NA | NA | FH | C | N | 5/9/2018 | 1120 | 1 | | ☐ | X | | |
| 11 | CUF-FH-BG-WCD-O-20180510 | WCD | NA | NA | FH | C | N | 5/10/2018 | 1018 | 1 | | ☐ | X | | |
| 12 | CUF-FH-BG-WCU-O-20180508 | WCU | NA | NA | FH | C | N | 5/8/2018 | 1808 | 1 | | ☐ | X | | |
| 13 | | | | | | | | | | | | | | | |

Additional Comments/Special Instructions:

| RELINQUISHED BY / AFFILIATION | DATE | TIME | ACCEPTED BY / AFFILIATION | DATE | TIME |
|---|---|---|---|---|---|
| Tyler Baker / TVA | 1-17-19 | 1310 | [illegible] Pace | 1-18-19 | 0855 |

| SHIPPING METHOD | SAMPLER NAME AND SIGNATURE |
|---|---|
| Fedex | Tyler Baker Tyler Baker |

**Sample Receipt Conditions**

| Temperature in °C | Sample on Ice? | Sample Intact? | Trip Blank? |
|---|---|---|---|
| ☑ Yes ☐ No | ☑ Yes ☐ No | ☑ Yes ☐ No | ☐ Yes ☑ No |
| ☐ Yes ☐ No | ☐ Yes ☐ No | ☐ Yes ☐ No | ☐ Yes ☐ No |
| ☐ Yes ☐ No | ☐ Yes ☐ No | ☐ Yes ☐ No | ☐ Yes ☐ No |
| ☐ Yes ☐ No | ☐ Yes ☐ No | ☐ Yes ☐ No | ☐ Yes ☐ No |

Tyler Baker 1-17-19





Form TVA 30067A

Pace Analytical Services, LLC
1241 Bellevue Street, Suite
Green Bay, WI 54302

# Sample Preservation Receipt Form

Client Name: TVA

Project # 40182296

All containers needing preservation have been checked and noted below: □Yes □No ☑N/A

Lab Lot# of pH paper:

Lab Std #ID of preservation (if pH adjusted):

Initial when completed:

Date/ Time:

| Pace Lab # | Glass | | | | | | | Plastic | | | | | | | Vials | | | | | | Jars | | | General | | | VOA Vials (>6mm) * | H2SO4 pH ≤2 | NaOH+Zn Act pH ≥9 | NaOH pH ≥12 | HNO3 pH ≤2 | pH after adjusted | Volume (mL) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | AG1U | AG1H | AG4S | AG4U | AG5U | AG2S | BG3U | BP1U | BP2N | BP2Z | BP3U | BP3C | BP3N | BP3S | DG9A | DG9T | VG9U | VG9H | VG9M | VG9D | JGFU | WGFU | WPFU | SP5T | ZPLC | GN | | | | | | | |
| 001 | | | | | | | | | | | | | | | | | | | | | | | | | ✓ | | | | | | | | 2.5 / 5 / 10 |
| 002 | | | | | | | | | | | | | | | | | | | | | | | | | ✓ | | | | | | | | 2.5 / 5 / 10 |
| 003 | | | | | | | | | | | | | | | | | | | | | | | | | ✓ | | | | | | | | 2.5 / 5 / 10 |
| 004 | | | | | | | | | | | | | | | | | | | | | | | | | ✓ | | | | | | | | 2.5 / 5 / 10 |
| 005 | | | | | | | | | | | | | | | | | | | | | | | | | ✓ | | | | | | | | 2.5 / 5 / 10 |
| 006 | | | | | | | | | | | | | | | | | | | | | | | | | ✓ | | | | | | | | 2.5 / 5 / 10 |
| 007 | | | | | | | | | | | | | | | | | | | | | | | | | ✓ | | | | | | | | 2.5 / 5 / 10 |
| 008 | | | | | | | | | | | | | | | | | | | | | | | | | ✓ | | | | | | | | 2.5 / 5 / 10 |
| 009 | | | | | | | | | | | | | | | | | | | | | | | | | ✓ | | | | | | | | 2.5 / 5 / 10 |
| 010 | | | | | | | | | | | | | | | | | | | | | | | | | ✓ | | | | | | | | 2.5 / 5 / 10 |
| 011 | | | | | | | | | | | | | | | | | | | | | | | | | ✓ | | | | | | | | 2.5 / 5 / 10 |
| 012 | | | | | | | | | | | | | | | | | | | | | | | | | ✓ | | | | | | | | 2.5 / 5 / 10 |
| 013 | | | | | | | | | | | | | | | | | | | | | | | | | ✓ | | | | | | | | 2.5 / 5 / 10 |
| 014 | | | | | | | | | | | | | | | | | | | | | | | | | ✓ | | | | | | | | 2.5 / 5 / 10 |
| 015 | | | | | | | | | | | | | | | | | | | | | | | | | ✓ | | | | | | | | 2.5 / 5 / 10 |
| 016 | | | | | | | | | | | | | | | | | | | | | | | | | ✓ | | | | | | | | 2.5 / 5 / 10 |
| 017 | | | | | | | | | | | | | | | | | | | | | | | | | ✓ | | | | | | | | 2.5 / 5 / 10 |
| 018 | | | | | | | | | | | | | | | | | | | | | | | | | ✓ | | | | | | | | 2.5 / 5 / 10 |
| 019 | | | | | | | | | | | | | | | | | | | | | | | | | ✓ | | | | | | | | 2.5 / 5 / 10 |
| 020 | | | | | | | | | | | | | | | | | | | | | | | | | ✓ | | | | | | | | 2.5 / 5 / 10 |

Exceptions to preservation check: VOA, Coliform, TOC, TOX, TOH, O&G, WI DRO, Phenolics, Other: _____ Headspace in VOA Vials (>6mm) : □Yes □No ☑N/A ***If yes look in headspace column**

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| AG1U | 1 liter amber glass | BP1U | 1 liter plastic unpres | DG9A | 40 mL amber ascorbic | JGFU | 4 oz amber jar unpres |
| AG1H | 1 liter amber glass HCL | BP2N | 500 mL plastic HNO3 | DG9T | 40 mL amber Na Thio | WGFU | 4 oz clear jar unpres |
| AG4S | 125 mL amber glass H2SO4 | BP2Z | 500 mL plastic NaOH, Znact | VG9U | 40 mL clear vial unpres | WPFU | 4 oz plastic jar unpres |
| AG4U | 120 mL amber glass unpres | BP3U | 250 mL plastic unpres | VG9H | 40 mL clear vial HCL | | |
| AG5U | 100 mL amber glass unpres | BP3C | 250 mL plastic NaOH | VG9M | 40 mL clear vial MeOH | SP5T | 120 mL plastic Na Thiosulfate |
| AG2S | 500 mL amber glass H2SO4 | BP3N | 250 mL plastic HNO3 | VG9D | 40 mL clear vial DI | ZPLC | ziploc bag |
| BG3U | 250 mL clear glass unpres | BP3S | 250 mL plastic H2SO4 | | | GN: | |



1500

| Pace Analytical<br>1241 Bellevue Street, Green Bay, WI 54302 | Document Name:<br>Sample Condition Upon Receipt (SCUR) | Document Revised: 25Apr2018 |
|---|---|---|
| | Document No.:<br>F-GB-C-031-Rev.07 | Issuing Authority:<br>Pace Green Bay Quality Office |

## Sample Condition Upon Receipt Form (SCUR)

Project #: WO#: 40182296

40182296

**Client Name:** TVA

**Courier:** ☐ CS Logistics ☒ Fed Ex ☐ Speedee ☐ UPS ☐ Waltco
☐ Client ☐ Pace Other:

**Tracking #:** 785033156392

**Custody Seal on Cooler/Box Present:** ☒ yes ☒ no Seals intact: ☒ yes ☐ no

**Custody Seal on Samples Present:** ☒ yes ☒ no Seals intact: ☒ yes ☐ no

**Packing Material:** ☒ Bubble Wrap ☒ Bubble Bags ☐ None ☐ Other

**Thermometer Used** SR - 9 **Type of Ice:** Wet Blue Dry None ☑ Samples on ice, cooling process has begun

**Cooler Temperature** Uncorr: -1.5 /Corr: 0

**Temp Blank Present:** ☐ yes ☑ no **Biological Tissue is Frozen:** ☑ yes ☐ no

Temp should be above freezing to 6°C.
Biota Samples may be received at ≤ 0°C.

**Person examining contents:**
Date: 1-19-19
Initials: SW

| | | |
|---|---|---|
| Chain of Custody Present: | ☑Yes ☐No ☐N/A | 1. |
| Chain of Custody Filled Out: | ☑Yes ☐No ☐N/A | 2. |
| Chain of Custody Relinquished: | ☑Yes ☐No ☐N/A | 3. |
| Sampler Name & Signature on COC: | ☑Yes ☐No ☐N/A | 4. |
| Samples Arrived within Hold Time: | ☑Yes ☐No | 5. |
| - VOA Samples frozen upon receipt | ☐Yes ☐No | Date/Time: |
| **Short Hold Time Analysis (<72hr):** | ☐Yes ☑No | 6. |
| **Rush Turn Around Time Requested:** | ☐Yes ☑No | 7. |
| Sufficient Volume: | | 8. |
| For Analysis: ☑Yes ☐No MS/MSD: | ☐Yes ☑No ☐N/A | |
| Correct Containers Used: | ☑Yes ☐No | 9. |
| -Pace Containers Used: | ☐Yes ☑No ☐N/A | |
| -Pace IR Containers Used: | ☐Yes ☐No ☑N/A | |
| Containers Intact: | ☑Yes ☐No | 10. |
| Filtered volume received for Dissolved tests | ☐Yes ☐No ☑N/A | 11. |
| Sample Labels match COC: | ☑Yes ☐No ☐N/A | 12. |
| -Includes date/time/ID/Analysis Matrix: | B | |
| Trip Blank Present: | ☐Yes ☐No ☑N/A | 13. |
| Trip Blank Custody Seals Present | ☐Yes ☐No ☑N/A | |
| Pace Trip Blank Lot # (if purchased): | | |

**Client Notification/ Resolution:** If checked, see attached form for additional comments ☐

Person Contacted: Date/Time:

Comments/ Resolution: Custody seals on samples fell off with handling. 1-19-19 SW

**Project Manager Review:** RMR for TW **Date:** 01/21/19

Pace Analytical Services, LLC
1241 Bellevue Street - Suite 9
Green Bay, WI 54302
(920)469-2436

## SAMPLE SUMMARY

Project: 0777010 CUMBERLAND FOSSIL PLAN
Pace Project No.: 40182297

| Lab ID | Sample ID | Matrix | Date Collected | Date Received |
|---|---|---|---|---|
| 40182297001 | CUF-FH-BG-CURD-O-20180509 | Tissue | 05/09/18 17:50 | 01/17/19 08:55 |
| 40182297002 | CUF-FH-BG-CURA-O-20180509 | Tissue | 05/09/18 14:17 | 01/17/19 08:55 |
| 40182297003 | CUF-FH-BG-CURU-O-20180509 | Tissue | 05/09/18 11:20 | 01/17/19 08:55 |
| 40182297004 | CUF-FH-BG-WCD-O-20180510 | Tissue | 05/10/18 10:18 | 01/17/19 08:55 |
| 40182297005 | CUF-FH-BG-WCU-O-20180508 | Tissue | 05/08/18 18:08 | 01/17/19 08:55 |
| 40182297006 | CUF-FH-CC-CURD-O-20180509 | Tissue | 05/09/18 17:50 | 01/17/19 08:55 |
| 40182297007 | CUF-FH-CC-CURA-O-20180509 | Tissue | 05/09/18 14:17 | 01/17/19 08:55 |
| 40182297008 | CUF-FH-CC-CURU-O-20180502 | Tissue | 05/02/18 13:00 | 01/17/19 08:55 |
| 40182297009 | CUF-FH-CC-WCD-O-20180410 | Tissue | 04/10/18 17:15 | 01/17/19 08:55 |
| 40182297010 | CUF-FH-CC-WCU-O-20180410 | Tissue | 04/10/18 15:30 | 01/17/19 08:55 |
| 40182297011 | CUF-FH-LB-CURD-O-20180410 | Tissue | 04/10/18 13:25 | 01/17/19 08:55 |
| 40182297012 | CUF-FH-LB-CURA-O-20180410 | Tissue | 04/10/18 11:15 | 01/17/19 08:55 |
| 40182297013 | CUF-FH-LB-CURU-O-20180509 | Tissue | 05/09/18 11:20 | 01/17/19 08:55 |
| 40182297014 | CUF-FH-LB-WCD-O-20180410 | Tissue | 04/10/18 17:15 | 01/17/19 08:55 |
| 40182297015 | CUF-FH-LB-WCU-O-20180410 | Tissue | 04/10/18 15:30 | 01/17/19 08:55 |
| 40182297016 | CUF-FH-RS-CURD-O-20180509 | Tissue | 05/09/18 17:50 | 01/17/19 08:55 |
| 40182297017 | CUF-FH-RS-CURA-O-20180501 | Tissue | 05/01/18 10:30 | 01/17/19 08:55 |
| 40182297018 | CUF-FH-RS-CURU-O-20180502 | Tissue | 05/02/18 13:00 | 01/17/19 08:55 |
| 40182297019 | CUF-FH-RS-WCD-O-20180510 | Tissue | 05/10/18 10:18 | 01/17/19 08:55 |
| 40182297020 | CUF-FH-RS-WCU-O-20180501 | Tissue | 05/01/18 16:40 | 01/17/19 08:55 |
| 40182297021 | 40182297-021 RINSE BLANK | Tissue | | 01/24/19 13:05 |



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1241 Bellevue Street - Suite 9
Green Bay, WI 54302
(920)469-2436

# PROJECT NARRATIVE

Project: 0777010 CUMBERLAND FOSSIL PLAN
Pace Project No.: 40182297

**Method:** **EPA 6020**
**Description:** 6020 MET ICPMS
**Client:** TENNESSEE VALLEY AUTHORITY
**Date:** March 01, 2019

**General Information:**
21 samples were analyzed for EPA 6020. All samples were received in acceptable condition with any exceptions noted below or on the chain-of custody and/or the sample condition upon receipt form (SCUR) attached at the end of this report.

**Hold Time:**
The samples were analyzed within the method required hold times with any exceptions noted below.

**Sample Preparation:**
The samples were prepared in accordance with EPA 3050B with any exceptions noted below.

**Initial Calibrations (including MS Tune as applicable):**
All criteria were within method requirements with any exceptions noted below.

**Continuing Calibration:**
All criteria were within method requirements with any exceptions noted below.

**Internal Standards:**
All internal standards were within QC limits with any exceptions noted below.

**Method Blank:**
All analytes were below the report limit in the method blank, where applicable, with any exceptions noted below.

**Laboratory Control Spike:**
All laboratory control spike compounds were within QC limits with any exceptions noted below.

**Matrix Spikes:**
All percent recoveries and relative percent differences (RPDs) were within acceptance criteria with any exceptions noted below.

**Additional Comments:**

Analyte Comments:

QC Batch: 312430

D3: Sample was diluted due to the presence of high levels of non-target analytes or other matrix interference.

- CUF-FH-BG-CURA-O-20180509 (Lab ID: 40182297002)
  - Silver
  - Arsenic
  - Boron
  - Beryllium
  - Calcium
  - Cadmium
  - Cobalt
  - Chromium
  - Copper
  - Lithium



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Green Bay, WI 54302
(920)469-2436

# PROJECT NARRATIVE

Project: 0777010 CUMBERLAND FOSSIL PLAN
Pace Project No.: 40182297

**Method:** **EPA 6020**
**Description:** 6020 MET ICPMS
**Client:** TENNESSEE VALLEY AUTHORITY
**Date:** March 01, 2019

Analyte Comments:

QC Batch: 312430

D3: Sample was diluted due to the presence of high levels of non-target analytes or other matrix interference.

- CUF-FH-BG-CURA-O-20180509 (Lab ID: 40182297002)
  - Molybdenum
  - Nickel
  - Antimony
  - Strontium
  - Vanadium
- CUF-FH-BG-CURD-O-20180509 (Lab ID: 40182297001)
  - Silver
  - Arsenic
  - Boron
  - Barium
  - Beryllium
  - Cadmium
  - Cobalt
  - Chromium
  - Copper
  - Lithium
  - Molybdenum
  - Nickel
  - Antimony
  - Strontium
  - Vanadium
- CUF-FH-BG-CURU-O-20180509 (Lab ID: 40182297003)
  - Silver
  - Arsenic
  - Boron
  - Barium
  - Beryllium
  - Cadmium
  - Cobalt
  - Chromium
  - Copper
  - Lithium
  - Molybdenum
  - Nickel
  - Antimony
  - Strontium
  - Vanadium
- CUF-FH-BG-WCD-O-20180510 (Lab ID: 40182297004)
  - Silver
  - Arsenic
  - Boron
  - Barium



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# PROJECT NARRATIVE

Project: 0777010 CUMBERLAND FOSSIL PLAN
Pace Project No.: 40182297

**Method:** **EPA 6020**
**Description:** 6020 MET ICPMS
**Client:** TENNESSEE VALLEY AUTHORITY
**Date:** March 01, 2019

Analyte Comments:

QC Batch: 312430

D3: Sample was diluted due to the presence of high levels of non-target analytes or other matrix interference.

- CUF-FH-BG-WCD-O-20180510 (Lab ID: 40182297004)
  - Beryllium
  - Cadmium
  - Cobalt
  - Chromium
  - Copper
  - Lithium
  - Molybdenum
  - Nickel
  - Antimony
  - Strontium
  - Vanadium
- CUF-FH-BG-WCU-O-20180508 (Lab ID: 40182297005)
  - Silver
  - Arsenic
  - Boron
  - Beryllium
  - Calcium
  - Cadmium
  - Cobalt
  - Chromium
  - Copper
  - Lithium
  - Molybdenum
  - Nickel
  - Antimony
  - Strontium
  - Vanadium
- CUF-FH-CC-CURA-O-20180509 (Lab ID: 40182297007)
  - Silver
  - Arsenic
  - Boron
  - Barium
  - Beryllium
  - Cadmium
  - Cobalt
  - Chromium
  - Copper
  - Lithium
  - Molybdenum
  - Nickel
  - Antimony
  - Vanadium



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# PROJECT NARRATIVE

Project: 0777010 CUMBERLAND FOSSIL PLAN
Pace Project No.: 40182297

**Method:** **EPA 6020**
**Description:** 6020 MET ICPMS
**Client:** TENNESSEE VALLEY AUTHORITY
**Date:** March 01, 2019

Analyte Comments:

QC Batch: 312430

D3: Sample was diluted due to the presence of high levels of non-target analytes or other matrix interference.

- CUF-FH-CC-CURD-O-20180509 (Lab ID: 40182297006)
  - Silver
  - Arsenic
  - Boron
  - Barium
  - Beryllium
  - Cadmium
  - Cobalt
  - Chromium
  - Copper
  - Lithium
  - Molybdenum
  - Nickel
  - Antimony
  - Vanadium
- CUF-FH-CC-CURU-O-20180502 (Lab ID: 40182297008)
  - Silver
  - Arsenic
  - Boron
  - Beryllium
  - Cadmium
  - Cobalt
  - Chromium
  - Copper
  - Lithium
  - Molybdenum
  - Nickel
  - Antimony
  - Vanadium
- CUF-FH-CC-WCD-O-20180410 (Lab ID: 40182297009)
  - Silver
  - Arsenic
  - Boron
  - Beryllium
  - Cadmium
  - Cobalt
  - Chromium
  - Copper
  - Lithium
  - Molybdenum
  - Nickel
  - Antimony
  - Vanadium



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# PROJECT NARRATIVE

Project: 0777010 CUMBERLAND FOSSIL PLAN
Pace Project No.: 40182297

**Method:** **EPA 6020**
**Description:** 6020 MET ICPMS
**Client:** TENNESSEE VALLEY AUTHORITY
**Date:** March 01, 2019

Analyte Comments:

QC Batch: 312430

D3: Sample was diluted due to the presence of high levels of non-target analytes or other matrix interference.

- CUF-FH-CC-WCU-O-20180410 (Lab ID: 40182297010)
  - Silver
  - Arsenic
  - Boron
  - Beryllium
  - Cadmium
  - Cobalt
  - Chromium
  - Copper
  - Lithium
  - Molybdenum
  - Nickel
  - Antimony
  - Vanadium
- CUF-FH-LB-CURA-O-20180410 (Lab ID: 40182297012)
  - Silver
  - Arsenic
  - Boron
  - Barium
  - Beryllium
  - Calcium
  - Cadmium
  - Cobalt
  - Chromium
  - Copper
  - Lithium
  - Molybdenum
  - Nickel
  - Antimony
  - Strontium
  - Vanadium
- CUF-FH-LB-CURD-O-20180410 (Lab ID: 40182297011)
  - Silver
  - Arsenic
  - Boron
  - Barium
  - Beryllium
  - Calcium
  - Cadmium
  - Cobalt
  - Chromium
  - Copper
  - Lithium



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Pace Analytical Services, LLC
1241 Bellevue Street - Suite 9
Green Bay, WI 54302
(920)469-2436

# PROJECT NARRATIVE

Project: 0777010 CUMBERLAND FOSSIL PLAN
Pace Project No.: 40182297

**Method:** **EPA 6020**
**Description:** 6020 MET ICPMS
**Client:** TENNESSEE VALLEY AUTHORITY
**Date:** March 01, 2019

Analyte Comments:

QC Batch: 312430

D3: Sample was diluted due to the presence of high levels of non-target analytes or other matrix interference.

- CUF-FH-LB-CURD-O-20180410 (Lab ID: 40182297011)
  - Molybdenum
  - Nickel
  - Antimony
  - Strontium
  - Vanadium
- CUF-FH-LB-CURU-O-20180509 (Lab ID: 40182297013)
  - Silver
  - Arsenic
  - Boron
  - Barium
  - Beryllium
  - Cadmium
  - Cobalt
  - Chromium
  - Copper
  - Lithium
  - Molybdenum
  - Nickel
  - Antimony
  - Strontium
  - Vanadium
- CUF-FH-LB-WCD-O-20180410 (Lab ID: 40182297014)
  - Silver
  - Arsenic
  - Boron
  - Barium
  - Beryllium
  - Calcium
  - Cadmium
  - Cobalt
  - Chromium
  - Copper
  - Lithium
  - Molybdenum
  - Nickel
  - Antimony
  - Strontium
  - Vanadium
- CUF-FH-LB-WCU-O-20180410 (Lab ID: 40182297015)
  - Silver
  - Arsenic
  - Boron



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# PROJECT NARRATIVE

Project: 0777010 CUMBERLAND FOSSIL PLAN
Pace Project No.: 40182297

**Method:** **EPA 6020**
**Description:** 6020 MET ICPMS
**Client:** TENNESSEE VALLEY AUTHORITY
**Date:** March 01, 2019

Analyte Comments:

QC Batch: 312430

D3: Sample was diluted due to the presence of high levels of non-target analytes or other matrix interference.

- CUF-FH-LB-WCU-O-20180410 (Lab ID: 40182297015)
  - Barium
  - Beryllium
  - Calcium
  - Cadmium
  - Cobalt
  - Chromium
  - Copper
  - Lithium
  - Molybdenum
  - Nickel
  - Antimony
  - Strontium
  - Vanadium
- CUF-FH-RS-CURA-O-20180501 (Lab ID: 40182297017)
  - Silver
  - Arsenic
  - Boron
  - Beryllium
  - Cadmium
  - Cobalt
  - Chromium
  - Copper
  - Lithium
  - Molybdenum
  - Nickel
  - Antimony
  - Strontium
  - Vanadium
- CUF-FH-RS-CURD-O-20180509 (Lab ID: 40182297016)
  - Silver
  - Boron
  - Barium
  - Beryllium
  - Calcium
  - Cadmium
  - Cobalt
  - Chromium
  - Copper
  - Lithium
  - Molybdenum
  - Nickel
  - Antimony



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(920)469-2436

# PROJECT NARRATIVE

Project: 0777010 CUMBERLAND FOSSIL PLAN
Pace Project No.: 40182297

**Method:** **EPA 6020**
**Description:** 6020 MET ICPMS
**Client:** TENNESSEE VALLEY AUTHORITY
**Date:** March 01, 2019

Analyte Comments:

QC Batch: 312430

D3: Sample was diluted due to the presence of high levels of non-target analytes or other matrix interference.

- CUF-FH-RS-CURD-O-20180509 (Lab ID: 40182297016)
  - Strontium
  - Vanadium
- CUF-FH-RS-CURU-O-20180502 (Lab ID: 40182297018)
  - Silver
  - Arsenic
  - Boron
  - Barium
  - Beryllium
  - Cadmium
  - Cobalt
  - Chromium
  - Copper
  - Lithium
  - Molybdenum
  - Nickel
  - Antimony
  - Strontium
  - Vanadium
- CUF-FH-RS-WCD-O-20180510 (Lab ID: 40182297019)
  - Silver
  - Arsenic
  - Boron
  - Barium
  - Beryllium
  - Cadmium
  - Cobalt
  - Chromium
  - Copper
  - Lithium
  - Molybdenum
  - Nickel
  - Antimony
  - Strontium
  - Vanadium
- CUF-FH-RS-WCU-O-20180501 (Lab ID: 40182297020)
  - Silver
  - Arsenic
  - Boron
  - Barium
  - Beryllium
  - Cadmium
  - Cobalt



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(920)469-2436

# PROJECT NARRATIVE

Project: 0777010 CUMBERLAND FOSSIL PLAN
Pace Project No.: 40182297

**Method:** **EPA 6020**
**Description:** 6020 MET ICPMS
**Client:** TENNESSEE VALLEY AUTHORITY
**Date:** March 01, 2019

Analyte Comments:

QC Batch: 312430

D3: Sample was diluted due to the presence of high levels of non-target analytes or other matrix interference.

- CUF-FH-RS-WCU-O-20180501 (Lab ID: 40182297020)
  - Chromium
  - Copper
  - Lithium
  - Molybdenum
  - Nickel
  - Antimony
  - Strontium
  - Vanadium



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Green Bay, WI 54302
(920)469-2436

# PROJECT NARRATIVE

Project: 0777010 CUMBERLAND FOSSIL PLAN
Pace Project No.: 40182297

**Method:** **EPA 7473**
**Description:** 7473 Mercury, Tissue
**Client:** TENNESSEE VALLEY AUTHORITY
**Date:** March 01, 2019

**General Information:**
21 samples were analyzed for EPA 7473. All samples were received in acceptable condition with any exceptions noted below or on the chain-of custody and/or the sample condition upon receipt form (SCUR) attached at the end of this report.

**Hold Time:**
The samples were analyzed within the method required hold times with any exceptions noted below.

**Initial Calibrations (including MS Tune as applicable):**
All criteria were within method requirements with any exceptions noted below.

**Continuing Calibration:**
All criteria were within method requirements with any exceptions noted below.

**Method Blank:**
All analytes were below the report limit in the method blank, where applicable, with any exceptions noted below.

**Laboratory Control Spike:**
All laboratory control spike compounds were within QC limits with any exceptions noted below.

**Matrix Spikes:**
All percent recoveries and relative percent differences (RPDs) were within acceptance criteria with any exceptions noted below.

**Additional Comments:**



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Green Bay, WI 54302
(920)469-2436

# PROJECT NARRATIVE

Project: 0777010 CUMBERLAND FOSSIL PLAN
Pace Project No.: 40182297

**Method:** **ASTM D2974-87**
**Description:** Percent Moisture Reportable
**Client:** TENNESSEE VALLEY AUTHORITY
**Date:** March 01, 2019

**General Information:**
20 samples were analyzed for ASTM D2974-87. All samples were received in acceptable condition with any exceptions noted below or on the chain-of custody and/or the sample condition upon receipt form (SCUR) attached at the end of this report.

**Hold Time:**
The samples were analyzed within the method required hold times with any exceptions noted below.

**Initial Calibrations (including MS Tune as applicable):**
All criteria were within method requirements with any exceptions noted below.

**Continuing Calibration:**
All criteria were within method requirements with any exceptions noted below.

**Internal Standards:**
All internal standards were within QC limits with any exceptions noted below.

**Surrogates:**
All surrogates were within QC limits with any exceptions noted below.

**Method Blank:**
All analytes were below the report limit in the method blank, where applicable, with any exceptions noted below.

**Laboratory Control Spike:**
All laboratory control spike compounds were within QC limits with any exceptions noted below.

**Matrix Spikes:**
All percent recoveries and relative percent differences (RPDs) were within acceptance criteria with any exceptions noted below.

**Duplicate Sample:**
All duplicate sample results were within method acceptance criteria with any exceptions noted below.

**Additional Comments:**

This data package has been reviewed for quality and completeness and is approved for release.



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# CASE NARRATIVE - METALS ANALYSIS

**Lab Report Number (SDG):** 40182297
**Client:** TENNESSEE VALLEY AUTHORITY
**Project Name:** CUMBERLAND FOSSIL PLANT
**Project Number:** 0777010

## 1. RECEIPT

Samples were received frozen on dry ice and kept frozen at less than -10°C until time of preparation. Sample 40182297-021 RINSE BLANK was generated in the laboratory by rinsing the equipment used to stir the tissue samples with deionized water.

## 2. HOLDING TIMES

A. **Sample Preparation:** The samples, with the exception of 40182297-021 RINSE BLANK, were kept frozen prior to analysis, therefore the sample hold-time criteria is not applicable.

B. **Sample Analysis:** All method required holding times were met.

## 3. METHOD

**Preparation:** SW846 3050B, 7473
**Analysis:** SW846 6020A, 7473

## 4. PREPARATION

Sample preparation proceeded normally. Although sample 40182297-021 RINSE BLANK consists of deionized water, the sample was prepared in a manner consistent with the other tissue samples in this SDG (i.e., as if it were a tissue sample).

## 5. ANALYSIS

A. **Calibration:**

1. **Initial verification:** All method acceptance criteria were met.
2. **Continuing verification:** All method acceptance criteria were met.
3. **Reporting limit verification (CRDL):** All method acceptance criteria were met. Due to software limitations, the percent recoveries for Calcium, Copper, and Strontium are based on the water reporting limits rather than the tissue reporting limits and appear to recover two (Ca) and five (Cu, Sr) times higher than the true value.

B. **Blanks:**

1. **Initial calibration:** All method acceptance criteria were met.
2. **Continuing calibration:** All method acceptance criteria were met.
3. **Method:** All project specific acceptance criteria were met. Mercury (7473) was detected in the method blank 1827614 above the laboratory method detection limit (MDL) but below the laboratory reporting limit (PQL). The associated sample result was less than the MDL; no data qualifier was needed for this occurrence.
4. **Chicken:** A chicken blank is prepared and analyzed with each sample batch to determine the background contamination levels of the chicken used for the laboratory control spike (LCS). The chicken blank is analyzed down to the laboratory MDL. Calcium, Nickel, Selenium, and Zinc were detected at levels above the MDL in chicken blank 1821392. Calcium, Copper, Selenium, and Zinc were detected at levels above the MDL in chicken blank 1821932. The chicken blank results for these analytes were subtracted from the associated LCS results prior to calculating the percent recoveries of the spike.

C. **Spikes:**

1. **Lab Control Spike (LCS):** The associated LCS met all in-house accuracy criteria.
2. **SRM:** A Standard Reference Material was analyzed with each analytical batch. The in-house accuracy criteria were met.

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3. **Matrix Spike / Duplicate (MS/MSD):** Sample CUF-FH-CC-CURD-O-20180509 was designated as the 6020A matrix spike sample for this SDG. Sample CUF-FH-BG-CURU-O-20180509 was designated as the 7473 matrix spike sample for this SDG. All in-house accuracy and precision criteria were met. Batch QC was also analyzed with the 6020A and 7473 portions of this SDG.

D. **Sample Duplicates:** Not applicable.

E. **Internal Standards:** All in-house acceptance criteria were met for the internal standards used for quantification.

F. **ICPMS Interference Check Samples:** All acceptance criteria were met.

G. **ICPMS Serial Dilution:** All applicable acceptance criteria were met. Serial dilution % Difference is not evaluated for parent results less than fifty times the water reporting limit.

H. **Samples:** Sample analyses proceeded normally.

I. **Dilutions:** All 6020A samples with the exception of 40182297-021 RINSE BLANK were analyzed at a dilution to reduce matrix interference. The "D3" data qualifier was applied to diluted results less than the reporting limit on the final report.

J. **Reanalysis:** None required for this SDG.

K. **Comments:** Samples were reported on a wet weight basis.

I certify that this data package is in compliance, with the terms and conditions agreed to by **Pace Analytical Services, LLC** and by the client, both technically and for completeness, except for the conditions detailed above. The Laboratory Manager or his designee, as verified by the following signature, has authorized release of the data contained in this completed data package:

Signed: Jill A. Duranceau Date: 03/05/19

Name: Jill A Duranceau Position: Quality Assurance Auditor

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# CASE NARRATIVE - GENERAL CHEMISTRY ANALYSIS

**Lab Report Number (SDG):** 40182297
**Client:** TENNESSEE VALLEY AUTHORITY
**Project Name:** CUMBERLAND FOSSIL PLANT
**Project Number:** 0777010

## 1. RECEIPT

Samples were received frozen on dry ice and kept frozen at less than -10°C until time of preparation.

## 2. HOLDING TIMES

A. **Sample Preparation:** The samples were kept frozen prior to analysis therefore the sample hold-time criteria is not applicable.
B. **Sample Analysis:** All method recommended holding times were met.

## 3. METHOD

A. **Preparation:** NA
B. **Analysis:** ASTM D2974-87

## 4. PREPARATION

Sample preparation proceeded normally.

## 5. ANALYSIS

A. **Blanks:**
   1. **Method:** Not applicable to this SDG.
B. **Sample Duplicates:** Sample CUF-FH-LB-WCU-O-20180410 was designated as the parent sample for the duplicate analysis for the Percent Moisture. The in-house precision criteria were met.
C. **Samples:** Sample analyses proceeded normally.
D. **Dilutions:** Not applicable to this SDG.
E. **Reanalysis:** None required for this SDG.
F. **Comments:** No additional comments are needed.

I certify that this data package is in compliance with the terms and conditions agreed to by **Pace Analytical Services, LLC**, and by the client, both technically and for completeness, except for the conditions detailed above. The Laboratory Manager or his designee, as verified by the following signature, has authorized release of the data contained in this completed data package:

Signed: Leigh A Begalske Date: 02/22/19

Name: Leigh A. Begalske Position: Quality Assurance Auditor

40182297

## TVA Environmental Investigations

Tennessee Valley Authority

| COOLER No.: | 1 | of | 3 |
|---|---|---|---|
| COC No: | CUF_FH_20190117_1A | | |
| 2 of 6 Pages | | | |
| Task Desc: | CUF_FH | | |

### Chain-of-Custody / Analytical Request Document

Chain-of-Custody is a LEGAL DOCUMENT. All relevant fields must be completed and accurate

| Required Ship to Lab: | | Required Project Information: | | Required Sampler Information | |
|---|---|---|---|---|---|
| Lab Name: | Pace Green Bay | Site ID #: | Cumberland Fossil Plant | Sampler: Tyler Baker | |
| Lab Address: | 1241 Bellevue St | Project #: | 0777010 | Sampling Company: TVA | |
| | Suite 9 | Site Address | 815 Cumberland City Road | Address: TVA Chickamauga Power Service Center, 4601 N. Access Road | |
| | Green Bay, WI 54302 | City | Cumberland State, Zip: TN, 37763 | City/State: Chattanooga, TN | Phone: 423-876-6733 |
| Lab Manager Contact Information | | Site PM Name: | Roy Quinn | | |
| Lab PM: | Tod Noltemeyer | Phone/Fax: | 423-751-3753 | Sampling Team Number: | 1 |
| Phone/Fax: | 608-232-3300 | Site PM Email: | rrquinn@tva.gov | Send EDD/Hard Copy to: | tva-ei@envstd.com |
| Lab Email: | Tod.Noltemeyer@pacelabs.com | | | | |

Analysis Turnaround Time: ☐ CALENDAR DAYS ☑ WORKING DAYS

TAT if different from Below _____

☐ 24 Hours
☐ 3 Business Days
☐ 5 Business Days
☑ 10 Business Days (Standard)

| ITEMS # | SAMPLE ID Samples IDs MUST BE UNIQUE | SAMPLE LOCATION | Sample Depth: Depth Unit | Sample Depth: Feet | MATRIX CODE | G= GRAB C=COMP | SAMPLE TYPE | SAMPLE DATE | SAMPLE TIME | # OF CONTAINERS | Comments/ Lab Sample I.D. | MS/MSD | Filtered N | Preserve see comments | Analysis Fish |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 | CUF-FH-LB-WCD-F-20180410 | WCD | NA | NA | FH | C | N | 4/10/2018 | 1715 | 1 | | ☐ | | | X |
| 2 | CUF-FH-LB-WCU-F-20180410 | WCU | NA | NA | FH | C | N | 4/10/2018 | 1530 | 1 | | ☐ | | | X |
| 3 | CUF-FH-RS-CURD-F-20180509 | CURD | NA | NA | FH | C | N | 5/9/2018 | 1750 | 1 | | ☐ | | | X |
| 4 | CUF-FH-RS-CURA-F-20180501 | CURA | NA | NA | FH | C | N | 5/1/2018 | 1030 | 1 | | ☐ | | | X |
| 5 | CUF-FH-RS-CURU-F-20180502 | CURU | NA | NA | FH | C | N | 5/2/2018 | 1300 | 1 | | ☐ | | | X |
| 6 | CUF-FH-RS-WCD-F-20180510 | WCD | NA | NA | FH | C | N | 5/10/2018 | 1018 | 1 | | ☐ | | | X |
| 7 | CUF-FH-RS-WCU-F-20180501 | WCU | NA | NA | FH | C | N | 5/1/2018 | 1640 | 1 | | ☐ | | | X |
| 8 | CUF-FH-BG-CURD-O-20180509 | CURD | NA | NA | FH | C | N | 5/9/2018 | 1750 | 1 | 001 | ☐ | | | X |
| 9 | CUF-FH-BG-CURA-O-20180509 | CURA | NA | NA | FH | C | N | 5/9/2018 | 1417 | 1 | 002 | ☐ | | | X |
| 10 | CUF-FH-BG-CURU-O-20180509 | CURU | NA | NA | FH | C | N | 5/9/2018 | 1120 | 1 | 003 | ☐ | | | X |
| 11 | CUF-FH-BG-WCD-O-20180510 | WCD | NA | NA | FH | C | N | 5/10/2018 | 1018 | 1 | 004 | ☐ | | | X |
| 12 | CUF-FH-BG-WCU-O-20180508 | WCU | NA | NA | FH | C | N | 5/8/2018 | 1808 | 1 | 005 | ☐ | | | X |
| 13 | | | | | | | | | | | | | | | |

Additional Comments/Special Instructions:

| RELINQUISHED BY / AFFILIATION | DATE | TIME | ACCEPTED BY / AFFILIATION | DATE | TIME |
|---|---|---|---|---|---|
| Tyler Baker / TVA | 1-17-19 | 1310 | [signature] TVA | 1/18/19 | 0855 |

Sample Receipt Conditions: ☑ Yes ☑ Yes ☑ Yes ☐ Yes / ☐ No ☐ No ☐ No ☑ No

| SHIPPING METHOD: | SAMPLER NAME AND SIGNATURE |
|---|---|
| Fedex | Tyler Baker [signature] |

| Temperature in °C | Sample on Ice? | Sample Intact? | Trip Blank? |
|---|---|---|---|
| | | | |

Form TVA 30067A

40182297

## TVA Environmental Investigations

**Tennessee Valley Authority**

| | | | |
|---|---|---|---|
| COOLER No.: | 1 | of | 3 |
| COC No: | CUF_FH_20190117_1A | | |
| 3 of 6 Pages | | | |
| Task Desc: | CUF_FH | | |

### Chain-of-Custody / Analytical Request Document

**Chain-of-Custody is a LEGAL DOCUMENT. All relevant fields must be completed and accurate**

| Required Ship to Lab: | | Required Project Information: | | Required Sampler Information | |
|---|---|---|---|---|---|
| Lab Name: | Pace Green Bay | Site ID #: | Cumberland Fossil Plant | Sampler: Tyler Baker | |
| Lab Address: | 1241 Bellevue St | Project #: | 0777010 | Sampling Company: TVA | |
| | Suite 9 | Site Address | 815 Cumberland City Road | Address: TVA Chickamauga Power Service Center, 4601 N. Access Road | |
| | Green Bay, WI 54302 | City | Cumberland | State, Zip: TN, 37763 | City/State: Chattanooga, TN Phone: 423-876-6733 |
| Lab Manager Contact Information | | Site PM Name: | Roy Quinn | | |
| Lab PM: | Tod Noltemeyer | Phone/Fax: | 423-751-3753 | Sampling Team Number: | 1 |
| Phone/Fax: | 608-232-3300 | Site PM Email: | rquinn@tva.gov | Send EDD/Hard Copy to: | tva-ei@envstd.com |
| Lab Email: | Tod.Noltemeyer@pacelabs.com | | | | |

**Analysis Turnaround Time**

☐ CALENDAR DAYS ☑ WORKING DAYS

TAT if different from Below _____

☐ 24 Hours
☐ 3 Business Days
☐ 5 Business Days
☑ 10 Business Days (Standard)

| ITEMS # | SAMPLE ID Samples IDs MUST BE UNIQUE | SAMPLE LOCATION | Sample Depth Start Depth (Depth Unit: Feet) | Sample Depth End Depth | MATRIX CODE | G= GRAB C=COMP | SAMPLE TYPE | SAMPLE DATE | SAMPLE TIME | # OF CONTAINERS | Comments/ Lab Sample I.D. | MS/MSD | Analysis: Fish | Preserve: see comments | Filtered: N |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 | CUF-FH-CC-CURD-O-20180509 | CURD | NA | NA | FH | C | N | 5/9/2018 | 1750 | 1 | 006 | ☐ | X | | |
| 2 | CUF-FH-CC-CURA-O-20180509 | CURA | NA | NA | FH | C | N | 5/9/2018 | 1417 | 1 | 007 | ☐ | X | | |
| 3 | CUF-FH-CC-CURU-O-20180502 | CURU | NA | NA | FH | C | N | 5/2/2018 | 1300 | 1 | 008 | ☐ | X | | |
| 4 | CUF-FH-CC-WCD-O-20180410 | WCD | NA | NA | FH | C | N | 4/10/2018 | 1715 | 1 | 009 | ☐ | X | | |
| 5 | CUF-FH-CC-WCU-O-20180410 | WCU | NA | NA | FH | C | N | 4/10/2018 | 1530 | 1 | 010 | ☐ | X | | |
| 6 | CUF-FH-LB-CURD-O-20180410 | CURD | NA | NA | FH | C | N | 4/10/2018 | 1325 | 1 | 011 | ☐ | X | | |
| 7 | CUF-FH-LB-CURA-O-20180410 | CURA | NA | NA | FH | C | N | 4/10/2018 | 1115 | 1 | 012 | ☐ | X | | |
| 8 | CUF-FH-LB-CURU-O-20180509 | CURU | NA | NA | FH | C | N | 5/9/2018 | 1120 | 1 | 013 | ☐ | X | | |
| 9 | CUF-FH-LB-WCD-O-20180410 | WCD | NA | NA | FH | C | N | 4/10/2018 | 1715 | 1 | 014 | ☐ | X | | |
| 10 | CUF-FH-LB-WCU-O-20180410 | WCU | NA | NA | FH | C | N | 4/10/2018 | 1530 | 1 | 015 | ☐ | X | | |
| 11 | CUF-FH-RS-CURD-O-20180509 | CURD | NA | NA | FH | C | N | 5/9/2018 | 1750 | 1 | 016 | ☐ | X | | |
| 12 | CUF-FH-RS-CURA-O-20180501 | CURA | NA | NA | FH | C | N | 5/1/2018 | 1030 | 1 | 017 | ☐ | X | | |
| 13 | CUF-FH-RS-CURU-O-20180502 | CURU | NA | NA | FH | C | N | 5/2/2018 | 1300 | 1 | 018 | ☐ | X | | |

Additional Comments/Special Instructions:

| RELINQUISHED BY / AFFILIATION | DATE | TIME | ACCEPTED BY / AFFILIATION | DATE | TIME |
|---|---|---|---|---|---|
| Tyler Baker / TVA | 1-17-19 | 1310 | [illegible] for | 1/18/19 | 0855 |
| | | | | | |
| | | | | | |
| | | | | | |

**Sample Receipt Conditions**

| Temperature in °C | Sample on Ice? | Sample Intact? | Trip Blank? |
|---|---|---|---|
| ☑ Yes ☐ No | ☑ Yes ☐ No | ☑ Yes ☐ No | ☐ Yes ☑ No |
| ☐ Yes ☐ No | ☐ Yes ☐ No | ☐ Yes ☐ No | ☐ Yes ☐ No |
| ☐ Yes ☐ No | ☐ Yes ☐ No | ☐ Yes ☐ No | ☐ Yes ☐ No |
| ☐ Yes ☐ No | ☐ Yes ☐ No | ☐ Yes ☐ No | ☐ Yes ☐ No |

| SHIPPING METHOD: | SAMPLER NAME AND SIGNATURE |
|---|---|
| Fedex | Tyler Baker Tyler Baker |

Form TVA 30067A

40182297

# TVA Environmental Investigations

Tennessee Valley Authority

| | |
|---|---|
| COOLER No.: | of 3 |
| COC No: | CUF_FH_20190117_1A |
| 4 of 6 Pages | |
| Task Desc: | CUF_FH |

## Chain-of-Custody / Analytical Request Document

**Chain-of-Custody is a LEGAL DOCUMENT. All relevant fields must be completed and accurate**

| Required Ship to Lab: | | Required Project Information: | | Required Sampler Information | |
|---|---|---|---|---|---|
| Lab Name: | Pace Green Bay | Site ID #: | Cumberland Fossil Plant | Sampler: Tyler Baker | |
| Lab Address: | 1241 Bellevue St | Project #: | 0777010 | Sampling Company: TVA | |
| | Suite 9 | Site Address | 815 Cumberland City Road | Address: TVA Chickamauga Power Service Center, 4601 N. Access Road | |
| | Green Bay, WI 54302 | City | Cumberland State, Zip: TN, 37763 | City/State: Chattanooga, TN | Phone: 423-876-6733 |
| Lab Manager Contact Information | | Site PM Name: | Roy Quinn | | |
| Lab PM: | Tod Noltemeyer | Phone/Fax: | 423-751-3753 | Sampling Team Number: | 1 |
| Phone/Fax: | 608-232-3300 | Site PM Email: | rquinn@tva.gov | Send EDD/Hard Copy to: | tva-ei@envsid.com |
| Lab Email: | Tod.Noltemeyer@pacelabs.com | | | | |

**Analysis Turnaround Time**

☐ CALENDAR DAYS ☑ WORKING DAYS

TAT if different from Below _____

☐ 24 Hours
☐ 3 Business Days
☐ 5 Business Days
☑ 10 Business Days (Standard)

| ITEMS # | SAMPLE ID Samples IDs MUST BE UNIQUE | SAMPLE LOCATION | Sample Depth Depth Unit | Start Depth (Feet) | End Depth (Feet) | MATRIX CODE | G= GRAB C=COMP | SAMPLE TYPE | SAMPLE DATE | SAMPLE TIME | # OF CONTAINERS | Comments/ Lab Sample I.D. | MS/MSD | Analysis: Fish | Filtered: N | Preserve: see comments |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 | CUF-FH-RS-WCD-O-20180510 | WCD | | NA | NA | FH | C | N | 5/10/2018 | 1018 | 1 | 019 | ☐ | X | | |
| 2 | CUF-FH-RS-WCU-O-20180501 | WCU | | NA | NA | FH | C | N | 5/1/2018 | 1640 | 1 | 020 | ☐ | X | | |
| 3 | CUF-FH-BG-CURD-L-20180509 | CURD | | NA | NA | FH | C | N | 5/9/2018 | 1750 | 1 | | ☐ | X | | |
| 4 | CUF-FH-BG-CURA-L-20180509 | CURA | | NA | NA | FH | C | N | 5/9/2018 | 1417 | 1 | | ☐ | X | | |
| 5 | CUF-FH-BG-CURU-L-20180509 | CURU | | NA | NA | FH | C | N | 5/9/2018 | 1120 | 1 | | ☐ | X | | |
| 6 | CUF-FH-BG-WCD-L-20180510 | WCD | | NA | NA | FH | C | N | 5/10/2018 | 1018 | 1 | | ☐ | X | | |
| 7 | CUF-FH-BG-WCU-L-20180508 | WCU | | NA | NA | FH | C | N | 5/8/2018 | 1808 | 1 | | ☐ | X | | |
| 8 | CUF-FH-CC-CURD-L-20180509 | CURD | | NA | NA | FH | C | N | 5/9/2018 | 1750 | 1 | | ☐ | X | | |
| 9 | CUF-FH-CC-CURA-L-20180509 | CURA | | NA | NA | FH | C | N | 5/9/2018 | 1417 | 1 | | ☐ | X | | |
| 10 | CUF-FH-CC-CURU-L-20180502 | CURU | | NA | NA | FH | C | N | 5/2/2018 | 1300 | 1 | | ☐ | X | | |
| 11 | CUF-FH-CC-WCD-L-20180410 | WCD | | NA | NA | FH | C | N | 4/10/2018 | 1715 | 1 | | ☐ | X | | |
| 12 | CUF-FH-CC-WCU-L-20180410 | WCU | | NA | NA | FH | C | N | 4/10/2018 | 1530 | 1 | | ☐ | X | | |
| 13 | | | | | | | | | | | | | ☐ | | | |

Additional Comments/Special Instructions:

| RELINQUISHED BY / AFFILIATION | DATE | TIME | ACCEPTED BY / AFFILIATION | DATE | TIME |
|---|---|---|---|---|---|
| Tyler Baker / TVA | 1-17-19 | 1310 | [illegible] | 1/18/19 | 0855 |
| | | | | | |
| | | | | | |
| | | | | | |

Sample Receipt Conditions: ☐ Yes ☐ No

| SHIPPING METHOD: | SAMPLER NAME AND SIGNATURE |
|---|---|
| Fedex | Tyler Baker Tyler Baker |

Temperature in °C | Sample on Ice? | Sample Intact? | Trip Blank?

Form TVA 30067A



40182297

Pace Analytical Services, LLC
1241 Bellevue Street, Suite
Green Bay, WI 54430



# Sample Preservation Receipt Form

Client Name: TVA

Project # 40182297

All containers needing preservation have been checked and noted below: □Yes □No ☑N/A

Initial when completed: Date/Time:

Lab Lot# of pH paper: Lab Std #ID of preservation (if pH adjusted):

| Pace Lab # | Glass | | | | | | | Plastic | | | | | | | Vials | | | | | | Jars | | | General | | | VOA Vials (>6mm) * | H2SO4 pH ≤2 | NaOH+Zn Act pH ≥9 | NaOH pH ≥12 | HNO3 pH ≤2 | pH after adjusted | Volume (mL) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | AG1U | AG1H | AG4S | AG4U | AG5U | AG2S | BG3U | BP1U | BP2N | BP2Z | BP3U | BP3C | BP3N | BP3S | DG9A | DG9T | VG9U | VG9H | VG9M | VG9D | JGFU | WGFU | WPFU | SP5T | ZPLC | GN | | | | | | | |
| 001 | | | | | | | | | | | | | | | | | | | | | | | | | / | | | | | | | | 2.5 / 5 / 10 |
| 002 | | | | | | | | | | | | | | | | | | | | | | | | | / | | | | | | | | 2.5 / 5 / 10 |
| 003 | | | | | | | | | | | | | | | | | | | | | | | | | / | | | | | | | | 2.5 / 5 / 10 |
| 004 | | | | | | | | | | | | | | | | | | | | | | | | | / | | | | | | | | 2.5 / 5 / 10 |
| 005 | | | | | | | | | | | | | | | | | | | | | | | | | / | | | | | | | | 2.5 / 5 / 10 |
| 006 | | | | | | | | | | | | | | | | | | | | | | | | | / | | | | | | | | 2.5 / 5 / 10 |
| 007 | | | | | | | | | | | | | | | | | | | | | | | | | / | | | | | | | | 2.5 / 5 / 10 |
| 008 | | | | | | | | | | | | | | | | | | | | | | | | | / | | | | | | | | 2.5 / 5 / 10 |
| 009 | | | | | | | | | | | | | | | | | | | | | | | | | / | | | | | | | | 2.5 / 5 / 10 |
| 010 | | | | | | | | | | | | | | | | | | | | | | | | | / | | | | | | | | 2.5 / 5 / 10 |
| 011 | | | | | | | | | | | | | | | | | | | | | | | | | / | | | | | | | | 2.5 / 5 / 10 |
| 012 | | | | | | | | | | | | | | | | | | | | | | | | | / | | | | | | | | 2.5 / 5 / 10 |
| 013 | | | | | | | | | | | | | | | | | | | | | | | | | / | | | | | | | | 2.5 / 5 / 10 |
| 014 | | | | | | | | | | | | | | | | | | | | | | | | | / | | | | | | | | 2.5 / 5 / 10 |
| 015 | | | | | | | | | | | | | | | | | | | | | | | | | / | | | | | | | | 2.5 / 5 / 10 |
| 016 | | | | | | | | | | | | | | | | | | | | | | | | | / | | | | | | | | 2.5 / 5 / 10 |
| 017 | | | | | | | | | | | | | | | | | | | | | | | | | / | | | | | | | | 2.5 / 5 / 10 |
| 018 | | | | | | | | | | | | | | | | | | | | | | | | | / | | | | | | | | 2.5 / 5 / 10 |
| 019 | | | | | | | | | | | | | | | | | | | | | | | | | / | | | | | | | | 2.5 / 5 / 10 |
| 020 | | | | | | | | | | | | | | | | | | | | | | | | | / | | | | | | | | 2.5 / 5 / 10 |

Exceptions to preservation check: VOA, Coliform, TOC, TOX, TOH, O&G, WI DRO, Phenolics, Other: _____ Headspace in VOA Vials (>6mm): □Yes □No ☑N/A ***If yes look in headspace column**

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| AG1U | 1 liter amber glass | BP1U | 1 liter plastic unpres | DG9A | 40 mL amber ascorbic | JGFU | 4 oz amber jar unpres |
| AG1H | 1 liter amber glass HCL | BP2N | 500 mL plastic HNO3 | DG9T | 40 mL amber Na Thio | WGFU | 4 oz clear jar unpres |
| AG4S | 125 mL amber glass H2SO4 | BP2Z | 500 mL plastic NaOH, Znact | VG9U | 40 mL clear vial unpres | WPFU | 4 oz plastic jar unpres |
| AG4U | 120 mL amber glass unpres | BP3U | 250 mL plastic unpres | VG9H | 40 mL clear vial HCL | | |
| AG5U | 100 mL amber glass unpres | BP3C | 250 mL plastic NaOH | VG9M | 40 mL clear vial MeOH | SP5T | 120 mL plastic Na Thiosulfate |
| AG2S | 500 mL amber glass H2SO4 | BP3N | 250 mL plastic HNO3 | VG9D | 40 mL clear vial DI | ZPLC | ziploc bag |
| BG3U | 250 mL clear glass unpres | BP3S | 250 mL plastic H2SO4 | | | GN: | |



1502

| Pace Analytical<br>1241 Bellevue Street, Green Bay, WI 54302 | Document Name:<br>Sample Condition Upon Receipt (SCUR) | Document Revised: 25Apr2018 |
|---|---|---|
| | Document No.:<br>F-GB-C-031-Rev.07 | Issuing Authority:<br>Pace Green Bay Quality Office |

# Sample Condition Upon Receipt Form (SCUR)

Project #:

WO#: 40182297

40182297

**Client Name:** TVA

**Courier:** ☐ CS Logistics ☑ Fed Ex ☐ Speedee ☐ UPS ☐ Waltco
☐ Client ☐ Pace Other:

**Tracking #:** 785033156392

**Custody Seal on Cooler/Box Present:** ☐ yes ☑ no Seals intact: ☐ yes ☐ no

**Custody Seal on Samples Present:** ☑ yes ☐ no Seals intact: ☑ yes ☐ no

**Packing Material:** ☑ Bubble Wrap ☑ Bubble Bags ☐ None ☐ Other

**Thermometer Used** SR - 9 **Type of Ice:** Wet Blue Dry None ☑ Samples on ice, cooling process has begun

**Cooler Temperature** Uncorr: -.5 /Corr: 0

**Temp Blank Present:** ☐ yes ☑ no **Biological Tissue is Frozen:** ☑ yes ☐ no

Temp should be above freezing to 6°C.
Biota Samples may be received at ≤ 0°C.

**Person examining contents:**
Date: 1-19-19
Initials: SCW

| | | |
|---|---|---|
| Chain of Custody Present: | ☑Yes ☐No ☐N/A | 1. |
| Chain of Custody Filled Out: | ☑Yes ☐No ☐N/A | 2. |
| Chain of Custody Relinquished: | ☑Yes ☐No ☐N/A | 3. |
| Sampler Name & Signature on COC: | ☑Yes ☐No ☐N/A | 4. |
| Samples Arrived within Hold Time: | ☑Yes ☐No | 5. |
| - VOA Samples frozen upon receipt | ☐Yes ☐No | Date/Time: |
| **Short Hold Time Analysis (<72hr):** | ☐Yes ☑No | 6. |
| **Rush Turn Around Time Requested:** | ☐Yes ☑No | 7. |
| Sufficient Volume: For Analysis: ☑Yes ☐No MS/MSD: | ☐Yes ☑No ☑N/A | 8. |
| Correct Containers Used: | ☑Yes ☐No | 9. |
| -Pace Containers Used: | ☐Yes ☑No ☐N/A | |
| -Pace IR Containers Used: | ☐Yes ☐No ☑N/A | |
| Containers Intact: | ☑Yes ☐No | 10. |
| Filtered volume received for Dissolved tests | ☐Yes ☐No ☑N/A | 11. |
| Sample Labels match COC: | ☑Yes ☐No ☐N/A | 12. |
| -Includes date/time/ID/Analysis Matrix: B | | |
| Trip Blank Present: | ☐Yes ☐No ☐N/A | 13. |
| Trip Blank Custody Seals Present | ☐Yes ☐No ☐N/A | |
| Pace Trip Blank Lot # (if purchased): | | |

**Client Notification/ Resolution:** If checked, see attached form for additional comments ☐

Person Contacted: Date/Time:

Comments/ Resolution: Custody seals on samples fell off with handling 1-19-19 SCW

**Project Manager Review:** [illegible] for TW **Date:** 01/21/19

Pace Analytical Services, LLC
1241 Bellevue Street - Suite 9
Green Bay, WI 54302
(920)469-2436

## SAMPLE SUMMARY

Project: 0777010 CUMBERLAND FOSSIL PLAN
Pace Project No.: 40182299

| Lab ID | Sample ID | Matrix | Date Collected | Date Received |
|---|---|---|---|---|
| 40182299001 | CUF-FH-SH-CURD-WF-20180410 | Tissue | 04/10/18 13:25 | 01/17/19 08:55 |
| 40182299002 | CUF-FH-SH-CURA-WF-20180410 | Tissue | 04/10/18 11:15 | 01/17/19 08:55 |
| 40182299003 | CUF-FH-SH-CURU-WF-20180417 | Tissue | 04/17/18 10:25 | 01/17/19 08:55 |
| 40182299004 | CUF-FH-SH-WCD-WF-20180410 | Tissue | 04/10/18 17:15 | 01/17/19 08:55 |
| 40182299005 | CUF-FH-SH-WCU-WF-20180410 | Tissue | 04/10/18 15:30 | 01/17/19 08:55 |
| 40182299006 | 40182299-006 RINSE BLANK | Tissue | 01/24/19 13:06 | 01/24/19 13:06 |



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# PROJECT NARRATIVE

Project: 0777010 CUMBERLAND FOSSIL PLAN
Pace Project No.: 40182299

**Method:** **EPA 6020**
**Description:** 6020 MET ICPMS
**Client:** TENNESSEE VALLEY AUTHORITY
**Date:** March 01, 2019

**General Information:**
6 samples were analyzed for EPA 6020. All samples were received in acceptable condition with any exceptions noted below or on the chain-of custody and/or the sample condition upon receipt form (SCUR) attached at the end of this report.

**Hold Time:**
The samples were analyzed within the method required hold times with any exceptions noted below.

**Sample Preparation:**
The samples were prepared in accordance with EPA 3050B with any exceptions noted below.

**Initial Calibrations (including MS Tune as applicable):**
All criteria were within method requirements with any exceptions noted below.

**Continuing Calibration:**
All criteria were within method requirements with any exceptions noted below.

**Internal Standards:**
All internal standards were within QC limits with any exceptions noted below.

**Method Blank:**
All analytes were below the report limit in the method blank, where applicable, with any exceptions noted below.

**Laboratory Control Spike:**
All laboratory control spike compounds were within QC limits with any exceptions noted below.

**Matrix Spikes:**
All percent recoveries and relative percent differences (RPDs) were within acceptance criteria with any exceptions noted below.

**Additional Comments:**

Analyte Comments:

QC Batch: 312617

D3: Sample was diluted due to the presence of high levels of non-target analytes or other matrix interference.

- CUF-FH-SH-CURD-WF-20180410 (Lab ID: 40182299001)
  - Arsenic
  - Boron
  - Beryllium
  - Cobalt
  - Chromium
  - Copper
  - Lithium
  - Nickel
  - Selenium
  - Vanadium



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# PROJECT NARRATIVE

Project: 0777010 CUMBERLAND FOSSIL PLAN
Pace Project No.: 40182299

**Method:** **EPA 6020**
**Description:** 6020 MET ICPMS
**Client:** TENNESSEE VALLEY AUTHORITY
**Date:** March 01, 2019

Analyte Comments:

QC Batch: 312617

D3: Sample was diluted due to the presence of high levels of non-target analytes or other matrix interference.

- CUF-FH-SH-CURD-WF-20180410 (Lab ID: 40182299001)
  - Zinc



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# PROJECT NARRATIVE

Project: 0777010 CUMBERLAND FOSSIL PLAN
Pace Project No.: 40182299

**Method:** **EPA 7473**
**Description:** 7473 Mercury, Tissue
**Client:** TENNESSEE VALLEY AUTHORITY
**Date:** March 01, 2019

**General Information:**
6 samples were analyzed for EPA 7473. All samples were received in acceptable condition with any exceptions noted below or on the chain-of custody and/or the sample condition upon receipt form (SCUR) attached at the end of this report.

**Hold Time:**
The samples were analyzed within the method required hold times with any exceptions noted below.

**Initial Calibrations (including MS Tune as applicable):**
All criteria were within method requirements with any exceptions noted below.

**Continuing Calibration:**
All criteria were within method requirements with any exceptions noted below.

**Method Blank:**
All analytes were below the report limit in the method blank, where applicable, with any exceptions noted below.

QC Batch: 314177

B: Analyte was detected in the associated method blank.

- BLANK for HBN 314177 [MERC/113 (Lab ID: 1829518)
  - Mercury

**Laboratory Control Spike:**
All laboratory control spike compounds were within QC limits with any exceptions noted below.

**Matrix Spikes:**
All percent recoveries and relative percent differences (RPDs) were within acceptance criteria with any exceptions noted below.

**Additional Comments:**



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# PROJECT NARRATIVE

Project: 0777010 CUMBERLAND FOSSIL PLAN
Pace Project No.: 40182299

**Method:** **ASTM D2974-87**
**Description:** Percent Moisture Reportable
**Client:** TENNESSEE VALLEY AUTHORITY
**Date:** March 01, 2019

**General Information:**
5 samples were analyzed for ASTM D2974-87. All samples were received in acceptable condition with any exceptions noted below or on the chain-of custody and/or the sample condition upon receipt form (SCUR) attached at the end of this report.

**Hold Time:**
The samples were analyzed within the method required hold times with any exceptions noted below.

**Initial Calibrations (including MS Tune as applicable):**
All criteria were within method requirements with any exceptions noted below.

**Continuing Calibration:**
All criteria were within method requirements with any exceptions noted below.

**Internal Standards:**
All internal standards were within QC limits with any exceptions noted below.

**Surrogates:**
All surrogates were within QC limits with any exceptions noted below.

**Method Blank:**
All analytes were below the report limit in the method blank, where applicable, with any exceptions noted below.

**Laboratory Control Spike:**
All laboratory control spike compounds were within QC limits with any exceptions noted below.

**Matrix Spikes:**
All percent recoveries and relative percent differences (RPDs) were within acceptance criteria with any exceptions noted below.

**Duplicate Sample:**
All duplicate sample results were within method acceptance criteria with any exceptions noted below.

**Additional Comments:**

This data package has been reviewed for quality and completeness and is approved for release.


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# CASE NARRATIVE - METALS ANALYSIS

**Lab Report Number (SDG):** 40182299
**Client:** TENNESSEE VALLEY AUTHORITY
**Project Name:** CUMBERLAND FOSSIL PLANT
**Project Number:** 0777010

## 1. RECEIPT

Samples were received frozen on dry ice and kept frozen at less than -10°C until time of preparation. Sample 40182299-006 RINSE BLANK was generated in the laboratory by rinsing the equipment used to stir the tissue samples with deionized water.

## 2. HOLDING TIMES

A. **Sample Preparation:** The samples, with the exception of 40182299-006 RINSE BLANK, were kept frozen prior to analysis, therefore the sample hold-time criteria is not applicable.

B. **Sample Analysis:** All method required holding times were met.

## 3. METHOD

**Preparation:** SW846 3050B, 7473
**Analysis:** SW846 6020A, 7473

## 4. PREPARATION

Sample preparation proceeded normally. Although sample 40182299-006 RINSE BLANK consists of deionized water, the sample was prepared in a manner consistent with the other tissue samples in this SDG (i.e., as if it were a tissue sample).

## 5. ANALYSIS

A. **Calibration:**

1. **Initial verification:** All method acceptance criteria were met.
2. **Continuing verification:** All method acceptance criteria were met.
3. **Reporting limit verification (CRDL):** All method acceptance criteria were met. Due to software limitations, the percent recoveries for Calcium, Copper, and Strontium are based on the water reporting limits rather than the tissue reporting limits and appear to recover two (Ca) and five (Cu, Sr) times higher than the true value.

B. **Blanks:**

1. **Initial calibration:** All method acceptance criteria were met.
2. **Continuing calibration:** All method acceptance criteria were met.
3. **Method:** All project specific acceptance criteria were met. Mercury (7473) was detected in the method blanks 1827614 and 1829518 above the laboratory method detection limit (MDL) but below the laboratory reporting limit (PQL). All associated sample results greater than the MDL but less than ten times the blank values were reported with the "B" data qualifier.
4. **Chicken:** A chicken blank is prepared and analyzed with each sample batch to determine the background contamination levels of the chicken used for the laboratory control spike (LCS). The chicken blank is analyzed down to the laboratory MDL. Calcium, Copper, Selenium, and Zinc were detected at levels above the MDL in chicken blank 1821932. The chicken blank results for these analytes were subtracted from the associated LCS results prior to calculating the percent recoveries of the spike.

C. **Spikes:**

1. **Lab Control Spike (LCS):** The associated LCS met all in-house accuracy criteria.
2. **SRM:** A Standard Reference Material was analyzed with each analytical batch. The in-house accuracy criteria were met.

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3. **Matrix Spike / Duplicate (MS/MSD):** Sample CUF-FH-SH-CURD-WF-20180410 was designated as the 6020A and 7473 matrix spike sample for this SDG. All in-house accuracy and precision criteria were met with the following exception. The Calcium parent result for CUF-FH-SH-CURD-WF-20180410 was greater than four times the spike amount; therefore, the accuracy criteria do not apply. The "P6" data qualifier was applied to the parent result on the final report. Batch QC was also analyzed with the 7473 portion of this SDG

D. **Sample Duplicates:** Not applicable.

E. **Internal Standards:** All in-house acceptance criteria were met for the internal standards used for quantification.

F. **ICPMS Interference Check Samples:** All acceptance criteria were met.

G. **ICPMS Serial Dilution:** All applicable acceptance criteria were met. Serial dilution % Difference is not evaluated for parent results less than fifty times the water reporting limit.

H. **Samples:** Sample analyses proceeded normally.

I. **Dilutions:** Sample CUF-FH-SH-CURD-WF-20180410 was analyzed at a dilution to reduce matrix interference on 6020A analytes. The "D3" data qualifier was applied to diluted results less than the reporting limit on the final report.

J. **Reanalysis:** None required for this SDG.

K. **Comments:** Samples were reported on a wet weight basis.

I certify that this data package is in compliance, with the terms and conditions agreed to by **Pace Analytical Services, LLC** and by the client, both technically and for completeness, except for the conditions detailed above. The Laboratory Manager or his designee, as verified by the following signature, has authorized release of the data contained in this completed data package:

Signed: Jill A. Duranceau Date: 03/05/19

Name: Jill A Duranceau Position: Quality Assurance Auditor

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# CASE NARRATIVE - GENERAL CHEMISTRY ANALYSIS

**Lab Report Number (SDG):** 40182299
**Client:** TENNESSEE VALLEY AUTHORITY
**Project Name:** CUMBERLAND FOSSIL PLANT
**Project Number:** 0777010

**1. RECEIPT**

Samples were received frozen on dry ice and kept frozen at less than -10°C until time of preparation.

**2. HOLDING TIMES**

A. **Sample Preparation:** The samples were kept frozen prior to analysis therefore the sample hold-time criteria is not applicable.

B. **Sample Analysis:** All method recommended holding times were met.

**3. METHOD**

A. **Preparation:** NA

B. **Analysis:** ASTM D2974-87

**4. PREPARATION**

Sample preparation proceeded normally.

**5. ANALYSIS**

A. **Blanks:**

1. **Method:** Not applicable to this SDG.

B. **Sample Duplicates:** Sample CUF-FH-SH-CURD-WF-20180410 was designated as the parent sample for the duplicate analysis for the Percent Moisture. The in-house precision criteria were met.

C. **Samples:** Sample analyses proceeded normally.

D. **Dilutions:** Not applicable to this SDG.

E. **Reanalysis:** None required for this SDG.

F. **Comments:** No additional comments are needed.

I certify that this data package is in compliance with the terms and conditions agreed to by **Pace Analytical Services, LLC**, and by the client, both technically and for completeness, except for the conditions detailed above. The Laboratory Manager or his designee, as verified by the following signature, has authorized release of the data contained in this completed data package:

Signed: Leigh A Begalske Date: 02/22/19

Name: Leigh A. Begalske Position: Quality Assurance Auditor

40182299

# TVA Environmental Investigations

Tennessee Valley Authority

## Chain-of-Custody / Analytical Request Document

Chain-of-Custody is a LEGAL DOCUMENT. All relevant fields must be completed and accurate

| | |
|---|---|
| COOLER No.: | 1 of 3 |
| COC No: | CUF_FH_20190117_1A |
| 6 of 6 Pages | |
| Task Desc: | CUF_FH |

| Required Ship to Lab: | | Required Project Information: | | Required Sampler Information | |
|---|---|---|---|---|---|
| Lab Name: | Pace Green Bay | Site ID #: | Cumberland Fossil Plant | Sampler: Tyler Baker | |
| Lab Address: | 1241 Bellevue St | Project #: | 0777010 | Sampling Company: TVA | |
| | Suite 9 | Site Address | 815 Cumberland City Road | Address: TVA Chickamauga Power Service Center, 4601 N Access Road | |
| | Green Bay, WI 54302 | City | Cumberland State, Zip: TN, 37763 | City/State: Chattanooga, TN | Phone: 423-876-6733 |
| Lab Manager Contact Information | | Site PM Name: | Roy Quinn | | |
| Lab PM: | Tod Nolterneyer | Phone/Fax: | 423-751-3753 | Sampling Team Number: | 1 |
| Phone/Fax: | 608-232-3300 | Site PM Email: | rquinn@tva.gov | Send EDD/Hard Copy to: | tva-ei@envsld.com |
| Lab Email: | Tod.Nolterneyer@pacelabs.com | | | | |

Analysis Turnaround Time: ☐ CALENDAR DAYS ☑ WORKING DAYS

TAT if different from Below _____

☐ 24 Hours
☐ 3 Business Days
☐ 5 Business Days
☑ 10 Business Days (Standard)

| ITEMS # | SAMPLE ID Samples IDs MUST BE UNIQUE | SAMPLE LOCATION | Sample Depth Depth Unit | Sample Depth Feet Start Depth | Sample Depth Feet End Depth | MATRIX CODE | G= GRAB C=COMP | SAMPLE TYPE | SAMPLE DATE | SAMPLE TIME | # OF CONTAINERS | Comments/ Lab Sample I.D. | MS/MSD | Analysis Fish | Filtered N | Preserve see comments |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 | CUF-FH-SH-CURD-WF-20180410 | CURD | | NA | NA | FH | C | N | 4/10/2018 | 1325 | 1 | 001 | ☐ | X | | |
| 2 | CUF-FH-SH-CURA-WF-20180410 | CURA | | NA | NA | FH | C | N | 4/10/2018 | 1115 | 1 | 002 | ☐ | X | | |
| 3 | CUF-FH-SH-CURU-WF-20180417 | CURU | | NA | NA | FH | C | N | 4/17/2018 | 1025 | 1 | 003 | ☐ | X | | |
| 4 | CUF-FH-SH-WCD-WF-20180410 | WCD | | NA | NA | FH | C | N | 4/10/2018 | 1715 | 1 | 004 | ☐ | X | | |
| 5 | CUF-FH-SH-WCU-WF-20180410 | WCU | | NA | NA | FH | C | N | 4/10/2018 | 1530 | 1 | 005 | ☐ | X | | |
| 6 | | | | | | | | | | | | | ☐ | | | |
| 7 | | | | | | | | | | | | | ☐ | | | |
| 8 | | | | | | | | | | | | | ☐ | | | |
| 9 | | | | | | | | | | | | | ☐ | | | |
| 10 | | | | | | | | | | | | | ☐ | | | |
| 11 | | | | | | | | | | | | | ☐ | | | |
| 12 | | | | | | | | | | | | | ☐ | | | |
| 13 | | | | | | | | | | | | | ☐ | | | |

Additional Comments/Special Instructions:

| RELINQUISHED BY / AFFILIATION | DATE | TIME | ACCEPTED BY / AFFILIATION | DATE | TIME |
|---|---|---|---|---|---|
| Tyler Baker / TVA | 1-17-19 | 1310 | [illegible] | 4/10/19 | 0835 |
| | | | | | |
| | | | | | |
| | | | | | |

Sample Receipt Conditions

| Temperature in °C | Sample on Ice? | Sample Intact? | Trip Blank? |
|---|---|---|---|
| ☐ Yes ☐ No | ☑ Yes ☐ No | ☑ Yes ☐ No | ☐ Yes ☑ No |
| ☐ Yes ☐ No | ☐ Yes ☐ No | ☐ Yes ☐ No | ☐ Yes ☐ No |
| ☐ Yes ☐ No | ☐ Yes ☐ No | ☐ Yes ☐ No | ☐ Yes ☐ No |
| ☐ Yes ☐ No | ☐ Yes ☐ No | ☐ Yes ☐ No | ☐ Yes ☐ No |

| SHIPPING METHOD: | SAMPLER NAME AND SIGNATURE |
|---|---|
| Fedex | Tyler Baker Tyler Baker |

Form TVA 30067A

Pace Analytical Services, LLC
1241 Bellevue Street, Suite
Green Bay, WI 54430



# Sample Preservation Receipt Form

Client Name: TVA

Project # 40182299

All containers needing preservation have been checked and noted below: ☐Yes ☐No ☑N/A

Initial when completed: Date/ Time:

Lab Lot# of pH paper: Lab Std #ID of preservation (if pH adjusted):

| Pace Lab # | Glass | | | | | | | Plastic | | | | | | | Vials | | | | | | Jars | | | General | | | VOA Vials (>6mm) * | H2SO4 pH ≤2 | NaOH+Zn Act pH ≥9 | NaOH pH ≥12 | HNO3 pH ≤2 | pH after adjusted | Volume (mL) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | AG1U | AG1H | AG4S | AG4U | AG5U | AG2S | BG3U | BP1U | BP2N | BP2Z | BP3U | BP3C | BP3N | BP3S | DG9A | DG9T | VG9U | VG9H | VG9M | VG9D | JGFU | WGFU | WPFU | SP5T | ZPLC | GN | | | | | | | |
| 001 | | | | | | | | | | | | | | | | | | | | | | | | | / | | | | | | | | 2.5 / 5 / 10 |
| 002 | | | | | | | | | | | | | | | | | | | | | | | | | / | | | | | | | | 2.5 / 5 / 10 |
| 003 | | | | | | | | | | | | | | | | | | | | | | | | | / | | | | | | | | 2.5 / 5 / 10 |
| 004 | | | | | | | | | | | | | | | | | | | | | | | | | / | | | | | | | | 2.5 / 5 / 10 |
| 005 | | | | | | | | | | | | | | | | | | | | | | | | | / | | | | | | | | 2.5 / 5 / 10 |
| 006 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | 2.5 / 5 / 10 |
| 007 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | 2.5 / 5 / 10 |
| 008 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | 2.5 / 5 / 10 |
| 009 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | 2.5 / 5 / 10 |
| 010 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | 2.5 / 5 / 10 |
| 011 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | 2.5 / 5 / 10 |
| 012 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | 2.5 / 5 / 10 |
| 013 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | 2.5 / 5 / 10 |
| 014 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | 2.5 / 5 / 10 |
| 015 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | 2.5 / 5 / 10 |
| 016 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | 2.5 / 5 / 10 |
| 017 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | 2.5 / 5 / 10 |
| 018 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | 2.5 / 5 / 10 |
| 019 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | 2.5 / 5 / 10 |
| 020 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | 2.5 / 5 / 10 |

Exceptions to preservation check: VOA, Coliform, TOC, TOX, TOH, O&G, WI DRO, Phenolics, Other: _____ Headspace in VOA Vials (>6mm) : ☐Yes ☐No ☑N/A ***If yes look in headspace column**

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| AG1U | 1 liter amber glass | BP1U | 1 liter plastic unpres | DG9A | 40 mL amber ascorbic | JGFU | 4 oz amber jar unpres |
| AG1H | 1 liter amber glass HCL | BP2N | 500 mL plastic HNO3 | DG9T | 40 mL amber Na Thio | WGFU | 4 oz clear jar unpres |
| AG4S | 125 mL amber glass H2SO4 | BP2Z | 500 mL plastic NaOH, Znact | VG9U | 40 mL clear vial unpres | WPFU | 4 oz plastic jar unpres |
| AG4U | 120 mL amber glass unpres | BP3U | 250 mL plastic unpres | VG9H | 40 mL clear vial HCL | | |
| AG5U | 100 mL amber glass unpres | BP3C | 250 mL plastic NaOH | VG9M | 40 mL clear vial MeOH | SP5T | 120 mL plastic Na Thiosulfate |
| AG2S | 500 mL amber glass H2SO4 | BP3N | 250 mL plastic HNO3 | VG9D | 40 mL clear vial DI | ZPLC | ziploc bag |
| BG3U | 250 mL clear glass unpres | BP3S | 250 mL plastic H2SO4 | | | GN: | |



40182299

Page 1 of 2

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| Pace Analytical™ 1241 Bellevue Street, Green Bay, WI 54302 | Document Name: Sample Condition Upon Receipt (SCUR) | Document Revised: 25Apr2018 |
|---|---|---|
| | Document No.: F-GB-C-031-Rev.07 | Issuing Authority: Pace Green Bay Quality Office |

# Sample Condition Upon Receipt Form (SCUR)

Project #: 4167799

WO#: 40182299

40182299

**Client Name:** TVA

**Courier:** ☐ CS Logistics ☒ Fed Ex ☐ Speedee ☐ UPS ☐ Waltco ☐ Client ☐ Pace Other:

**Tracking #:** 785033156392

**Custody Seal on Cooler/Box Present:** ☒ yes ☐ no Seals intact: ☒ yes ☐ no

**Custody Seal on Samples Present:** ☒ yes ☐ no Seals intact: ☒ yes ☐ no

**Packing Material:** ☒ Bubble Wrap ☒ Bubble Bags ☐ None ☐ Other

**Thermometer Used** SR - 9 **Type of Ice:** Wet Blue Dry None ☑ Samples on ice, cooling process has begun

**Cooler Temperature** Uncorr: -.5 /Corr: 0

**Temp Blank Present:** ☐ yes ☑ no **Biological Tissue is Frozen:** ☑ yes ☐ no

Temp should be above freezing to 6°C.
Biota Samples may be received at ≤ 0°C.

**Person examining contents:**
Date: 1-19-19
Initials: SW

| | | |
|---|---|---|
| Chain of Custody Present: | ☑Yes ☐No ☐N/A | 1. |
| Chain of Custody Filled Out: | ☑Yes ☐No ☐N/A | 2. |
| Chain of Custody Relinquished: | ☑Yes ☐No ☐N/A | 3. |
| Sampler Name & Signature on COC: | ☑Yes ☐No ☐N/A | 4. |
| Samples Arrived within Hold Time: | ☑Yes ☐No | 5. |
| - VOA Samples frozen upon receipt | ☐Yes ☐No | Date/Time: |
| **Short Hold Time Analysis (<72hr):** | ☐Yes ☑No | 6. |
| **Rush Turn Around Time Requested:** | ☐Yes ☑No | 7. |
| Sufficient Volume: For Analysis: ☑Yes ☐No MS/MSD: | ☐Yes ☑No ☐N/A | 8. |
| Correct Containers Used: | ☑Yes ☐No | 9. |
| -Pace Containers Used: | ☐Yes ☑No ☐N/A | |
| -Pace IR Containers Used: | ☐Yes ☐No ☑N/A | |
| Containers Intact: | ☑Yes ☐No | 10. |
| Filtered volume received for Dissolved tests | ☐Yes ☐No ☑N/A | 11. |
| Sample Labels match COC: -Includes date/time/ID/Analysis Matrix: B | ☑Yes ☐No ☐N/A | 12. |
| Trip Blank Present: | ☐Yes ☐No ☑N/A | 13. |
| Trip Blank Custody Seals Present | ☐Yes ☐No ☑N/A | |
| Pace Trip Blank Lot # (if purchased): | | |

**Client Notification/ Resolution:** If checked, see attached form for additional comments ☐

Person Contacted: Date/Time:

Comments/ Resolution: Custody seals on samples fell off with handling. 1-19-19 SW

**Project Manager Review:** RMR for TM **Date:** 01/21/19